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Water Resources Data for Hawaii and other Pacific Areas

Part 1. Surface Water Records
Part 2. Water Quality Records

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UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Prepared in cooperation with the State of Hawaii, the Government of Guam, the Government of American Samoa, and with other State, county, and Federal agencies

United States Department of the Interior
Geological Survey - Water Resources Division

WATER RESOURCES DATA
FOR
HAWAII AND OTHER PACIFIC AREAS
1965

Part 1: Surface Water Records

Prepared in cooperation with

Hawaii Department of Land and Natural Resources,
Division of Water and Land Development
Government of Guam
Government of American Samoa
City and County of Honolulu
Corps of Engineers, U.S. Army

Copies of this report may be obtained from
District Chief, Water Resources Division
U.S. Geological Survey
Room 330, First Insurance Bldg.
1100 Ward Avenue
Honolulu, Hawaii 96814

CALENDAR FOR FISCAL YEAR 1965

JULY 1964

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WATER RESOURCES DATA FOR HAWAII AND OTHER PACIFIC AREAS, 1965

Part 1. Surface Water Records

INTRODUCTION

The surface-water records for the 1965 fiscal year for gaging stations, partial-record stations, and miscellaneous sites within the State of Hawaii and other Pacific areas are given in this report. The records were collected and computed by the Water Resources Division of the U.S. Geological Survey, under the direction of Mearle M. Miller, district chief.

Through June 30, 1960, the records of discharge and stage of streams and contents and stage of lakes or reservoirs were published in an annual series of U.S. Geological Survey water-supply papers entitled "Surface Water Supply of the United States." Since 1951 there have been 20 volumes in the series; each volume covered an area whose boundaries coincided with those of certain natural drainage areas. The records in Hawaii are contained in the above series as "Surface Water Supply of Hawaii." Records for other Pacific areas are contained in a volume entitled "Surface Water Supply of Mariana, Caroline, and Samoa Islands."

Beginning with the 1961 fiscal year, streamflow records and related data have been released by the Geological Survey in annual reports on a State-boundary basis, except for Hawaii which includes other Pacific areas. Distribution of these basic-data reports is limited and primarily for local needs. Records will be published in Geological Survey water-supply papers at 5-year intervals.

COOPERATION

Cooperative agreements between the U.S. Geological Survey and organizations of the State of Hawaii for the systematic collection of streamflow records began in 1909. Cooperative agreements with the Territory of Guam began in 1953, and with the Territory of American Samoa in 1957. Organizations that supplied data are acknowledged in station descriptions. Organizations that assisted in collecting data through cooperative agreements with the Survey are:

State of Hawaii, Department of Land and Natural Resources.
Government of Guam.
Government of American Samoa.
City and County of Honolulu, Division of Engineering.

Assistance in the form of funds or services was given by the Corps of Engineers, U.S. Army, in collecting records for 26 gaging stations published in this report.

The following organizations aided in collecting records:

Boards of Water Supply of the City and County of Honolulu and Maui County; Lihue Plantation Co., Ltd.; Grove Farm Co., Inc.; McBryde Sugar Co., Ltd.; Waiahole Water Co., Ltd.; East Maui Irrigation Co., Ltd.; B.P. Bishop Estate; Kohala Ditch Co., Ltd.; Hawaiian Irrigation Co., Ltd.; and Pioneer Mill Co., Ltd.

DEFINITION OF TERMS AND ABBREVIATIONS

The terms of streamflow and other hydrologic data, as used in this report, are defined as follows:

Gaging station is a particular site on a stream, canal, lake, or reservoir where systematic observations of gage height or discharge are obtained. When used in connection with a discharge record, the term is applied only to those gaging stations where a continuous record of discharge is obtained.

Partial-record station is a particular site where limited streamflow data are collected systematically over a period of years for use in hydrologic analyses.

Cubic foot per second (cfs) is the rate of discharge of a stream whose channel is 1 square foot in cross-sectional area and whose average velocity is 1 foot per second.

Million gallons per day (mgd) is the rate of discharge of a stream measured in million gallons per day.

Acre-foot (ac-ft) is the quantity of water required to cover an acre to the depth of 1 foot and is equivalent to 43,560 cubic feet.

Cfs-day is the volume of water represented by a flow of 1 cubic foot per second for 24 hours. It is equivalent to 86,400 cubic feet, 1.983471 acre-feet, or 646,317 gallons, and represents a runoff of 0.0372 inch from 1 square mile.

Stage-discharge relation is the relation between gage height and the amount of water flowing in a channel, expressed as volume per unit of time.

Control designates a feature downstream from the gage that determines the stage-discharge relation at the gage. This feature may be a natural constriction of the channel, a long reach of the channel, or an artificial structure.

The drainage area of a stream at a specified location is that area, measured in a horizontal plane, which is so enclosed by a topographic divide that direct surface runoff from precipitation normally would drain by gravity into the river above the specified point. Figures of drainage area given herein include all closed basin, or noncontributing areas, within the area unless otherwise noted.

WSP is used as an abbreviation for "Water-Supply Paper" in reference to previously published reports.

DOWNSTREAM ORDER AND STATION NUMBERS

Stations are listed in the same downstream order used in the water-supply papers. Records are listed in a downstream direction along the main stem with all stations on a tributary entering above a main-stem station listed before that station. If a tributary enters between two main-stem stations, it is listed between them. A similar order is followed listing stations on first rank, second rank, and other ranks of tributaries. To indicate the rank of any tributary on which a gaging station is situated and the stream to which it is immediately tributary, each indention in the listing of gaging stations in the table of contents of this report represents one rank. This downstream order and system of indention shows which gaging stations are on tributaries between any two stations on a main stem and the rank of the tributary on which each gaging station is situated.

As an added means of identification, each gaging station and partial-record station has been assigned a station number. The numbers have been

assigned in the same downstream order used in the annual series of water-supply papers. In assigning station numbers, no distinction is made between partial-record stations and continuous-record gaging stations, so that the station number for a partial-record station indicates downstream order position in a list made up of both types of stations. Gaps are left in the numbers to allow for new stations that may be established; hence the numbers are not consecutive.

The complete number for each station, such as 40-2290.00, includes the district number "40" and a six digit station number. In this report, only the essential digits of the station number are shown. For example, the complete number 40-2290.00 would appear as 2290, just to the left of the station name. Also, the records are listed in downstream order by islands.

EXPLANATION OF DATA

The base data collected at gaging stations consist of records of stage and measurements of discharge. In addition, observations of factors affecting the stage-discharge relation, weather records, and other information are used to supplement base data in determining the daily flow. Records of stage are obtained from a water-stage recorder that gives either a continuous chart of the fluctuations or, for a digital recorder, a tape punched at 15-minute intervals. Measurements of discharge are made with a current meter by the general methods adopted by the Geological Survey on the basis of experience in stream gaging since 1888. These methods are described in Water-Supply Paper 888 and are also outlined in standard textbooks on the measurement of stream discharge.

Rating tables giving the discharge for any stage are prepared from stage-discharge relation curves defined by discharge measurements. If extensions to the rating curves are necessary to define the extremes of discharge, they are made on the basis of indirect measurements of peak discharge (such as slope-area or contracted-opening measurements, or computation of flow over dams or weirs), velocity-area studies, and logarithmic plotting. The application of the daily mean gage height to those rating tables gives the daily mean discharge, from which the monthly and yearly mean discharge are computed. If the stage-discharge relation is subject to change because of frequent or continual change in the physical features that form the control, the daily mean discharge is determined by the shifting-control method, in which correction factors based on individual discharge measurements and notes by engineers and observers are used in applying the gage heights to the rating tables. If the stage-discharge relation for a station is temporarily changed by the presence of aquatic growth or debris on the control, the daily mean discharge is computed by what is in effect the shifting-control method.

For some gaging stations there are periods when no gage-height record is obtained or the recorded gage height is so faulty that it cannot be used to compute the daily discharge. This happens when the recorder stops or otherwise fails to operate properly, intakes are plugged, or for various other reasons. For such periods the daily discharges are estimated on the basis of recorded range in stage, adjoining good record, discharge measurements, weather records, and comparison with other station records from the same or nearby basins.

The data in this report generally comprise a description of the station, a skeleton rating table, and a table showing the daily discharge and monthly and yearly discharge of the stream. Records are published for the fiscal year which begins on July 1 and ends on June 30. A calendar for the 1965 fiscal year is shown on page II to facilitate finding the day of the week for any date.

The description of the station gives the location, drainage area, records available, type and history of gages, average discharge, extremes of discharge, and general remarks. The location of the gaging station and the drainage area are obtained from the most accurate maps available. Under "Records available" are given periods for which there are published records for the present station or for stations generally equivalent to the present one. Under "Gage" are given the type of gage currently in use and the datum of the gage above mean sea level, and a condensed history of the types, locations, and datums of previous gages used during the period of records available. The references to "datum of 1929" and adjustments of other years are to the datum and adjustments of the U.S. Coast and Geodetic Survey. Under "Average discharge" is given the average discharge for the number of years indicated. It is not given for stations having fewer than five complete years of record or for stations where changes in water development during the period of record cause the figure to have little significance. Under "Extremes" are given the maximum discharge and gage height or the maximum daily discharge, the minimum discharge if there is little or no regulation, and the minimum daily discharge if there is extensive regulation. In the first paragraph, the data given are for the complete current fiscal year unless otherwise specified. In the second paragraph, the data given are for the periods of record within the calendar year dates in the heading (not necessarily those for the complete years indicated by the heading dates). Reliable information concerning major floods that have occurred outside the period of record is given in the third or last paragraph under "Extremes." Unless otherwise qualified, the maximum discharge corresponds to the crest stage obtained by use of a water-stage recorder or crest-stage indicator. If the maximum gage height did not occur at the same time as the maximum discharge, it is given separately. Information pertaining to the accuracy of the records and to conditions which affect the natural flow at the gaging station is given under "Remarks."

Skeleton rating tables are published for all stations except those for which the daily discharge for the greater part of the period was determined by the shifting-control method or other special methods involving an equivalent adjustment to the gage height of more than one-tenth foot. Skeleton rating tables are not published for canals, ditches, or springs.

The daily table gives the discharge corresponding to the daily mean gage height unless there are large or rapid changes in discharge during a day. For days having large or rapid changes, discharge for the day is computed by averaging the mean discharges for several parts of a day. For digital recorders, the daily mean discharge is always the average of the discharges at each punched reading.

In the table of daily discharge, the figures for the maximum day and the minimum day for each month are underlined. If the figure is repeated, it is underlined only on the first day of its occurrence.

In the monthly summary below the daily table, the line headed "Total" gives the sum of the daily figures; it is the total cfs-days for the month for Guam and Okinawa and million gallons for Hawaii and Samoa. The line headed "Mean" gives the average flow in millions of gallons per day and cubic feet per second during the month. Discharge for the month is expressed in acre-feet (line headed "Ac-ft").

In the yearly summary below the monthly summary, the figures of maximum are the maximum daily discharges, not the momentary discharges when the water was at crest stage. Likewise, the minimums in this summary are the minimum daily discharges.

Peak discharges and the times of their occurrence and corresponding gage heights for most stations are listed below the table of daily and monthly discharge. All independent peaks above the selected base are given. The base discharge, which is given in parentheses, is selected so that an average of about three peaks a year can be presented. Peak discharges are not published for any stream for which the peaks are subject to substantial control by man. Time of day is expressed in 24-hour time, for example 12:30 a.m. is 0030, 1:30 p.m. is 1330.

Footnotes to the table of daily discharge indicate periods for which discharge was computed or estimated by unusual or special methods because of no gage-height record or other conditions that reduce the degree of accuracy of the records. The footnotes are either reference footnotes, with corresponding symbols used in the table of daily discharge to indicate the days included, or general footnotes, introduced by the word "Note," in which the days included are stated. The method used in computing data for such footnoted periods have been explained in preceding paragraphs.

The accuracy of streamflow data depends primarily on (1) the stability of the stage-discharge relation or, if the control is unstable, the frequency of discharge measurements, and (2) the accuracy of observations of stage, measurements of discharge, and interpretation of records.

The station description states the degree of accuracy of the records. "Excellent" indicates that, in general, the error in the daily records is believed to be less than 5 percent; "good," less than 10 percent; "fair," less than 15 percent; and "poor," probably more than 15 percent. The records of monthly and yearly mean discharge and runoff are, in general, more nearly accurate than the daily records.

Discharge at some stations, as indicated by the monthly mean, may vary widely from natural runoff, owing to diversion, consumption, regulation by storage, increase or decrease in evaporation due to artificial causes, or to other factors.

SUPPLEMENTAL DATA

Data collected at partial-record stations and at miscellaneous sites are given at the end of this report. Data for partial-record stations are presented in two tables. The first is a table of discharge measurements at low-flow partial-record stations, and the second is a table of annual maximum stage and discharge at crest-stage stations. Discharge measurements at miscellaneous sites are given in a third table. Data for crest-stage partial-record stations in the State of Hawaii are not included in this report. They are included in an annual progress report entitled "An Investigation of Floods in Hawaii," copies of which may be obtained from the district office.

Information of a more detailed nature than that published for most of the gaging stations is on file in the district office, such as discharge measurements and recorder charts or nonrecording-gage readings. Most gaging-station records in the State through fiscal year 1960 have been analyzed with an electronic computer to give: (1) the number of days in each year that the daily discharge was between selected limits (duration tables); (2) the lowest mean discharge for selected numbers of consecutive days in each year; and (3) the highest mean discharge for selected numbers of consecutive days in each year. At some gaging stations water samples are collected from the stream for the purpose of making chemical analyses; measuring water temperature; or computing dissolved solids, suspended sediment loads, and particle-size distribution. For most of these samples, the results are published in Part 2 of this report. A reference is made herein, under the Remarks paragraph of the gaging station description, to water quality records collected on a regular basis. Information on the availability of electronic computer analyses and unpublished data may be obtained from the district office.

ISLAND OF KAUAI

100. Kawaikoi Stream near Waimea

Location.--Lat 22°08'09", long 159°37'22", on left bank at old trail crossing and 12.5 miles north of Waimea.

Drainage area.--4.1 sq mi, approximately.

Records available.--April 1909 to October 1912, December 1912 to March 1913, May 1913 to June 1915, August 1915 to May 1916, July to December 1916, July 1919 to June 1965. Monthly discharge only for some periods, published in WSP 1319.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 3,420 ft (by barometer). Prior to May 26, 1910, staff gage at site 300 ft downstream at different datum.

Average discharge.--49 years (1911-12, 1913-15, 1919-65), 22.3 mgd (34.5 cfs).

Extremes.--Maximum discharge during year, 3,230 mgd (5,000 cfs) Sept. 30 (gage height, 11.08 ft), from rating curve extended above 300 mgd as explained below; minimum, 3.38 mgd (5.23 cfs) Sept. 8, 9, 27.
1909-16, 1919-65: Maximum discharge, 6,900 mgd (10,700 cfs) Dec. 18, 1916 (gage height, 15.2 ft), from rating curve extended above 300 mgd on basis of slope-area measurements at gage heights 12.12 and 13.43 ft; minimum, 0.74 mgd (1.15 cfs) Sept. 21, 22, 1953.

Remarks.--Records good except those below 20 mgd, which are fair. No diversion above station.

Rating table (gage height, in feet, and discharge, in million gallons a day)

2.1	2.90	3.3	46.0
2.2	4.10	3.6	82.0
2.4	7.40	4.0	155
2.7	15.4	5.0	355
3.0	27.5	6.0	620

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	15.8	8.28	6.67	29.8	75.7	15.1	10.1	15.1	9.60	5.58	16.8	31.9
2	23.7	28.8	8.96	9.86	388	13.8	9.38	11.7	104	8.94	84.7	22.3
3	30.0	8.72	13.2	7.62	285	13.2	9.16	164	49.2	16.6	93.9	30.0
4	11.7	6.31	9.16	6.67	73.4	11.2	8.72	88.8	15.1	11.4	24.4	17.1
5	9.16	5.76	5.28	39.5	180	10.1	10.6	216	11.7	91.8	37.7	10.6
6	24.2	5.43	5.14	48.4	86.3	9.16	125	138	10.1	61.8	17.8	8.06
7	47.6	5.14	3.98	20.5	289	8.72	14.8	148	9.16	26.2	13.8	7.04
8	75.8	5.43	3.62	9.86	247	8.28	10.9	30.6	8.50	12.8	11.7	6.67
9	18.1	10.4	*3.38	7.22	95.3	82.8	29.3	52.4	15.0	9.38	10.1	6.13
10	10.6	5.58	3.50	9.38	41.0	315	168	20.9	84.2	33.3	9.60	5.94
11	7.40	4.40	9.47	7.22	24.8	367	17.8	18.1	15.7	17.1	9.16	5.76
12	16.2	4.84	11.2	5.76	19.6	200	25.7	17.1	12.2	11.4	8.28	18.5
13	8.72	9.44	6.13	4.99	17.8	125	71.0	17.1	28.2	76.0	9.57	23.7
14	5.94	28.7	15.4	*4.69	14.8	68.0	17.4	14.1	14.8	13.5	207	12.5
15	18.6	18.8	9.60	4.69	62.8	30.1	13.8	11.7	10.9	10.1	230	11.9
16	76.3	9.38	61.8	4.84	58.1	176	12.5	24.0	8.50	8.72	35.2	7.84
17	19.6	21.3	17.1	4.40	50.1	36.4	18.8	14.8	*7.62	8.06	21.7	6.85
18	9.86	8.94	20.1	72.4	37.7	215	13.8	10.6	6.85	7.40	14.4	6.13
19	7.22	28.0	8.28	33.3	62.6	233	10.9	14.4	6.67	6.85	12.8	7.40
20	6.13	9.16	8.06	14.4	18.1	44.6	*9.86	20.9	6.31	6.49	12.2	8.28
21	*12.5	6.13	6.85	8.28	20.1	37.0	69.0	17.1	5.94	6.13	10.6	10.7
22	18.0	5.28	5.14	7.62	107	28.0	17.4	15.7	5.76	5.76	9.38	15.1
23	296	19.7	5.43	26.8	*23.0	114	12.2	16.4	28.9	5.43	8.50	10.1
24	38.9	11.2	4.69	29.9	17.4	28.0	10.4	65.6	17.1	5.43	7.84	10.1
25	122	7.62	3.98	25.2	244	20.9	14.4	23.0	15.7	38.3	*7.40	7.22
26	27.0	6.85	3.62	119	97.1	17.4	11.2	13.5	8.94	205	22.3	5.58
27	13.8	5.28	3.38	95.0	32.7	15.4	14.1	11.9	6.85	75.6	15.1	8.66
28	10.4	4.84	3.74	30.1	27.5	13.8	22.6	10.1	6.49	95.3	11.7	10.9
29	8.72	4.25	9.50	17.1	19.6	12.5	148	---------	6.67	95.3	17.8	8.50
30	7.84	3.98	249	184	16.1	11.4	20.9	---------	8.06	25.2	19.8	6.13
31	8.28	3.98	---------	88.2	---------	10.5	25.2	---------	6.49	---------	16.8	---------
Total	1006.07	311.92	525.36	976.70	2731.6	2291.36	972.92	1221.6	551.21	1000.87	1028.03	347.59
Mean												
Mgd	32.5	10.1	17.5	31.5	91.1	73.9	31.4	43.6	17.8	33.4	33.2	11.6
Cfs	50.3	15.6	27.1	48.7	141	114	48.6	67.5	27.5	51.7	51.4	17.9
Ac-ft	3090	957	1610	3000	8380	7030	2990	3750	1690	3070	3150	1070

Calendar Year 1964: Max 388 Min 2.57 Mean mgd 35.4 Mean cfs 54.8 Ac-ft 39.760
Fiscal Year 1964-65: Max 388 Min 3.38 Mean mgd 35.5 Mean cfs 54.9 Ac-ft 39.790

* Discharge measurement made on this day.

Peak discharge (base, 1,300 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
9-30	1830	11.08	3,230	5,000	12-19	0130	8.07	1,400	2,170
11- 2	2230	8.01	1,380	2,140	2- 5	0200	7.91	1,330	2,060
12-16	1400	9.33	2,070	3,200					

130. Mohihi Stream at altitude 3,420 ft, near Waimea

Location.--Lat 22°07'13", long 159°36'14", on left bank at upper trail crossing, 3.8 miles northeast of confluence with Waiahulu and Poomau Streams, and 12 miles northeast of Waimea.

Drainage area.--1.6 sq mi, approximately.

Records available.--June 1920 to October 1926, October 1936 to June 1965. Published as "at altitude 3,500 ft, near Waimea" prior to July 1947 and July 1952 to June 1962, and as "near Waimea" July 1947 to June 1952.

Gage.--Water-stage recorder. Altitude of gage is 3,420 ft (from topographic map).

Average discharge.--34 years (1920-26, 1937-65), 5.38 mgd (8.32 cfs).

Extremes.--Maximum discharge during year, 860 mgd (1,330 cfs) Sept. 30 (gage height, 6.20 ft), from rating curve extended above 110 mgd; minimum, 0.77 mgd (1.19 cfs) Sept. 8, 9, 27.

1920-26, 1936-65: Maximum discharge, 1,250 mgd (1,930 cfs) Aug. 15, 1950 (gage height, 7.23 ft), from rating curve extended above 50 mgd; minimum, 0.08 mgd (0.12 cfs) Sept. 21, 1953.

Remarks.--Records fair. Continuous records of rainfall are obtained at station.

Rating table (gage height, in feet, and discharge, in million gallons a day)

1.0	0.77	2.0	11.8
1.1	1.15	2.3	21.1
1.2	1.65	2.6	35.9
1.4	2.98	3.0	68.5
1.7	6.15	3.5	128

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.60	1.50	1.11	18.0	21.8	6.46	4.59	5.02	2.55	1.40	3.60	4.48
2	5.15	2.69	1.25	5.15	42.3	5.78	4.28	3.96	11.7	2.48	44.2	5.02
3	6.46	2.02	1.35	3.33	55.4	5.28	4.38	23.7	9.88	5.96	56.0	4.28
4	3.77	1.50	1.89	2.69	29.2	4.80	4.17	24.0	4.17	4.69	10.7	4.48
5	2.84	1.25	1.30	7.92	36.0	4.38	6.40	59.5	2.91	31.6	11.6	2.91
6	3.96	1.30	1.07	13.1	25.2	3.96	29.8	24.3	2.55	29.8	6.30	2.26
7	4.47	1.20	.96	7.54	90.4	3.68	7.89	29.0	2.26	11.4	4.38	1.96
8	16.5	1.15	.85	3.86	65.0	3.51	5.78	8.84	2.08	4.69	3.60	1.77
9	4.90	2.14	*.77	2.69	30.2	3.98	7.96	12.8	2.14	3.42	3.07	1.65
10	3.51	1.55	.85	2.69	14.7	93.5	35.1	6.30	10.5	15.9	2.98	1.55
11	2.33	1.15	.96	2.33	9.22	65.3	9.03	5.02	4.38	8.46	2.76	1.50
12	5.85	1.15	1.89	1.89	7.39	44.9	9.66	4.59	2.69	4.59	2.48	3.56
13	3.77	1.30	1.55	1.71	6.46	31.1	18.6	4.59	2.55	51.9	3.22	6.88
14	2.20	3.62	2.14	*1.55	5.65	38.0	9.41	3.96	2.33	6.92	91.4	4.59
15	2.76	4.69	1.89	1.71	6.74	12.8	6.46	3.51	*2.02	4.48	12.8	4.69
16	13.7	2.48	12.4	2.14	12.3	58.1	5.3	3.60	1.89	3.60	6.92	2.98
17	5.78	10.2	5.90	1.71	9.03	18.1	7.4	3.60	1.71	3.16	6.02	2.26
18	3.07	3.33	5.65	6.56	7.70	85.2	5.4	2.98	1.65	2.69	4.69	1.83
19	2.20	4.17	2.55	8.84	10.7	76.2	5.3	3.07	1.55	2.33	4.28	2.02
20	1.83	2.33	2.02	4.48	6.02	21.5	*5.52	4.38	1.50	2.08	4.17	2.33
21	*1.60	1.65	2.14	2.55	10.3	18.6	12.8	4.48	1.45	1.89	3.60	2.02
22	3.24	1.35	1.40	2.14	68.8	15.0	6.92	4.17	1.45	1.77	3.60	1.83
23	37.3	2.63	1.30	3.42	*11.8	34.6	5.15	4.90	2.98	1.71	3.16	2.02
24	11.5	2.26	1.15	5.79	7.54	13.4	4.48	12.1	3.77	1.60	2.69	2.62
25	11.1	1.65	1.04	7.39	99.4	9.60	4.07	8.42	3.16	1.71	*2.40	2.14
26	9.56	1.45	.92	16.8	52.6	7.89	3.86	4.28	2.33	8.57	3.42	1.55
27	3.33	1.20	.81	17.7	15.6	6.92	3.77	3.86	1.83	13.2	3.24	1.40
28	2.33	1.07	.81	8.27	11.8	6.15	4.80	2.91	1.65	10.5	2.84	2.08
29	1.96	1.00	.88	4.69	8.84	5.52	9.38	---------	1.60	16.6	5.52	2.48
30	1.71	.92	89.0	48.8	7.24	5.02	5.78	---------	1.65	5.78	3.96	1.71
31	1.65	.88	---------	42.9	---------	4.90	6.92	---------	1.55	---------	4.07	---------
Total	183.93	66.78	147.80	260.34	785.33	714.13	260.36	281.84	96.43	264.88	323.67	82.85
Mean												
Mgd	5.93	2.15	4.93	8.40	26.2	23.0	8.40	10.1	3.11	8.83	10.4	2.76
Cfs	9.18	3.33	7.63	13.0	40.5	35.6	13.0	15.6	4.81	13.7	16.1	4.27
Ac-ft	564	205	454	799	2,410	2,190	799	865	296	813	993	254

Calendar Year 1964:	Max	154	Min	0.77	Mean mgd	9.67	Mean cfs	15.0	Ac-ft	10,870
Fiscal Year 1964-65:	Max	99.4	Min	0.77	Mean mgd	9.50	Mean cfs	14.7	Ac-ft	10,640

Peak discharge (base, 240 mgd, revised)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
9-30	1900	6.20	860	1,330	12-16	1330	4.62	345	534
10-30	1530	4.73	372	576	4- 5	1900	4.70	365	565
11-25	1800	4.26	257	398	4-13	0430	4.81	393	608
12-10	1100	4.88	414	641	5- 2	1500	4.53	322	498

* Discharge measurement made on this day.

140. Kokee ditch near Waimea

Location.--Lat 22°06'25", long 159°40'45", on left bank 1,000 ft west of road and 10.5 miles north of Waimea.

Records available.--September 1926 to June 1965.

Gage.--Water-stage recorder and suppressed weir. Altitude of gage is 3,310 ft (by barometer). Prior to July 1, 1962, at datum 0.07 ft higher.

Average discharge.--38 years (1927-65), 15.9 mgd (24.6 cfs).

Extremes.--1926-65: Maximum daily discharge, 68 mgd (105 cfs) Dec. 2, 1929, Mar. 4, 1933; no flow at times.

Remarks.--Records good. Kokee ditch diverts water at altitude 3,400 ft from all streams tributary to Waimea River west of Mohihi Stream for irrigation near Kekaha.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	17.5	11.6	8.10	28.9	45.9	16.3	14.0	18.4	21.1	12.4	13.8	43.7
2	23.3	33.6	8.50	14.7	39.4	14.2	12.4	31.6	43.1	16.0	17.5	31.4
3	32.7	13.8	16.5	11.0	29.5	12.4	11.4	47.3	40.0	23.5	24.3	29.0
4	16.5	10.1	12.9	9.70	26.4	19.0	13.5	51.9	23.8	24.0	12.7	22.4
5	11.6	8.70	7.56	16.8	23.9	22.3	19.3	38.4	21.6	21.9	13.9	12.9
6	23.7	8.30	7.22	28.9	17.8	20.5	23.2	27.1	20.8	50.7	7.92	13.6
7	29.0	7.73	6.04	25.3	23.8	19.0	9.95	28.0	19.3	39.8	11.7	18.0
8	37.2	7.22	5.08	13.5	24.4	18.2	14.0	33.1	18.2	22.0	12.7	17.0
9	24.1	13.3	4.92	9.90	20.2	22.9	15.6	33.0	17.8	17.5	10.5	16.3
10	14.9	8.50	5.08	11.6	18.0	47.1	26.8	25.1	51.7	25.3	17.1	15.6
11	10.3	6.88	*8.60	10.1	26.2	28.6	7.99	16.5	30.4	31.4	18.3	14.9
12	18.3	6.88	15.6	7.73	28.3	18.8	10.2	21.7	24.4	19.9	13.3	28.1
13	12.9	9.45	8.30	6.88	25.6	17.2	18.5	26.5	38.6	45.3	23.2	34.8
14	8.50	28.8	16.6	6.37	22.6	17.0	10.1	23.5	28.3	26.8	16.6	22.3
15	19.0	26.2	9.90	6.20	26.1	14.0	6.54	12.5	22.3	16.0	7.62	22.0
16	39.2	13.8	41.4	*6.37	39.4	6.56	4.76	20.2	19.0	12.7	13.6	16.8
17	27.3	24.2	24.2	6.04	29.3	6.32	8.70	28.3	*17.5	12.2	11.2	14.9
18	13.3	14.0	25.3	14.5	20.6	14.2	14.0	28.0	16.5	10.7	22.0	13.8
19	10.1	27.0	12.2	27.4	23.2	14.9	25.6	29.2	15.8	12.2	18.8	14.4
20	8.50	13.3	10.1	17.8	20.0	7.56	31.0	36.6	15.4	14.7	13.3	15.4
21	11.2	9.30	9.50	10.5	16.4	2.42	41.6	30.4	14.7	14.2	14.4	16.0
22	23.2	7.73	7.05	9.10	25.6	3.18	25.0	19.6	14.2	13.5	13.8	21.0
23	*32.8	21.3	7.22	21.2	16.5	13.8	17.0	20.5	31.5	13.1	11.8	17.5
24	43.9	15.8	6.37	21.1	11.5	12.7	20.1	30.8	28.0	12.9	21.3	16.0
25	33.5	11.0	5.56	25.9	23.8	11.0	34.5	21.6	25.6	18.1	21.4	13.8
26	34.8	9.70	5.08	36.5	15.4	9.70	32.4	9.50	17.8	41.9	19.6	11.4
27	20.8	7.90	4.76	42.7	11.4	8.50	*31.7	9.65	14.9	37.3	*22.1	12.9
28	16.3	6.88	4.92	37.6	10.1	15.7	42.7	14.2	14.2	34.1	23.5	16.3
29	13.8	6.37	8.07	21.4	8.10	24.1	31.2	---------	14.2	31.7	22.6	14.4
30	12.2	6.04	25.0	32.9	14.2	27.8	10.9	---------	15.4	23.2	21.1	11.4
31	12.4	5.72	---------	48.3	---------	21.4	12.0	---------	13.5	---------	27.0	---------
Total	652.80	401.10	337.63	586.89	683.60	507.34	596.64	733.15	709.6	695.0	518.64	568.0
Mean												
Mgd	21.1	12.9	11.3	18.9	22.8	16.4	19.2	26.2	22.9	23.2	16.7	18.9
Cfs	32.6	20.0	17.5	29.2	35.3	25.4	29.7	40.5	35.4	35.9	25.8	29.2
Ac-ft	2000	1230	1040	1800	2100	1560	1830	2250	2180	2130	1590	1740

Calendar Year 1964:	Max	48.3	Min	2.42	Mean mgd	16.7	Mean cfs	25.8	Ac-ft	18820		
Fiscal Year 1964-65:	Max	51.9	Min	2.42	Mean mgd	19.2	Mean cfs	29.7	Ac-ft	21450		

* Discharge measurement made on this day.

160. Waimea River at altitude 840 ft, near Waimea

Location.--Lat 22°04'55", long 159°39'15", on right bank in Waimea Canyon, 0.5 mile upstream from Koaie Stream, and 8.8 miles north of Waimea.

Drainage area.--20.0 sq mi.

Records available.--February to October 1916, October 1917 to June 1918, May 1925 to January 1949, September 1949 to July 1950, February 1951 to June 1965. Published as Waiahulu Stream near Waimea prior to July 1952 and as "at altitude 890 ft, near Waimea" July 1952 to June 1962.

Gage.--Water-stage recorder. Altitude of gage is 840 ft (from topographic map). Prior to May 25, 1925, at datum 1.55 ft lower.

Average discharge.--37 years (1925-48, 1951-65), 33.3 mgd (51.5 cfs).

Extremes.--Maximum discharge during year, 3,990 mgd (6,170 cfs) Sept. 30 (gage height, 9.24 ft), from rating curve extended above 130 mgd on basis of slope-area measurement at gage height 11.45 ft; minimum, 7.9 mgd (12.2 cfs) July 21, 22.
1916-18, 1925-65: Maximum discharge, 18,100 mgd (28,000 cfs) Aug. 17, 1950 (gage height, 18.3 ft, from floodmarks), from rating curve extended above 320 mgd; minimum, 5.2 mgd (8.0 cfs) Nov. 4, 1927.

Remarks.--Records fair except those for periods of no gage-height record and those below 10 mgd, which are poor. Kokee ditch (see preceding page) diverts above station for irrigation near Kekaha.

Rating table (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used July 1-23)

1.5	6.80	3.0	96.0
1.6	8.60	3.5	170
1.8	14.0	4.0	280
2.1	25.0	5.0	600
2.5	49.0	6.0	1,100

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	10.6	11.7	9.6	112	99.7	34.2	a 26	42.7	16.0	13.7	21.4	24.2
2	10.4	13.1	9.6	20.6	367	31.2	a 25	31.2	95.6	17.7	133	25.0
3	15.3	13.7	9.8	15.0	475	28.0	a 24	170	46.2	21.7	202	23.4
4	11.1	12.0	10.4	13.1	109	25.5	a 30	158	21.0	28.0	55.6	23.4
5	9.4	11.4	10.4	30.0	216	23.4	79.4	345	17.0	97.1	69.3	18.8
6	9.6	11.1	9.6	65.3	122	21.8	400	176	15.6	106	44.0	17.0
7	11.4	11.1	9.4	26.8	444	21.0	64.2	230	15.3	38.4	37.7	16.0
8	87.3	11.1	*9.4	17.3	399	20.3	38.4	58.4	14.7	22.2	30.0	15.3
9	12.3	11.7	9.4	14.0	174	41.3	59.9	79.5	15.0	18.4	24.6	15.0
10	10.1	11.7	9.4	13.1	69.0	506	474	42.7	90.1	48.3	27.4	14.7
11	8.4	10.8	9.4	13.1	39.0	489	71.8	*43.7	22.2	42.0	40.8	14.7
12	10.1	10.6	10.4	12.8	31.2	300	68.5	35.5	16.6	23.8	31.8	15.6
13	11.4	10.8	10.8	12.3	28.5	172	231	29.0	25.1	232	52.0	22.2
14	8.6	12.5	10.4	11.7	25.5	162	66.0	26.5	16.3	40.6	720	19.5
15	8.4	18.0	12.0	11.7	43.7	58.8	46.9	31.8	14.7	27.0	168	18.4
16	57.1	13.4	37.6	12.3	72.5	521	42.7	44.8	14.3	23.0	128	16.0
17	15.0	22.8	23.6	12.3	54.4	202	54.6	28.5	13.7	21.4	112	14.7
18	10.1	16.2	15.6	66.6	42.7	469	40.2	19.5	13.7	19.2	57.0	13.7
19	8.6	16.9	14.0	48.7	64.4	696	33.6	18.8	13.7	17.7	52.2	13.7
20	8.1	12.8	11.4	21.8	28.0	210	35.5	20.3	13.4	16.6	*44.8	14.0
21	7.9	11.1	11.7	14.7	35.8	194	128	21.0	13.4	16.3	36.0	14.0
22	8.6	10.1	10.6	12.8	350	a150	47.5	17.7	13.4	15.6	30.6	14.0
23	354	10.6	10.1	21.5	71.0	392	33.6	19.5	17.6	15.3	28.0	14.0
24	60.9	12.6	10.1	25.4	55.1	162	28.5	56.2	18.4	15.0	25.0	14.0
25	158	10.8	10.1	27.0	606	a100	a35	41.7	*15.6	22.7	23.0	14.3
26	66.0	10.4	9.8	125	443	a70	a30	20.3	15.3	190	25.0	13.4
27	19.9	10.1	9.6	114	137	a50	a35	18.0	14.3	98.8	24.6	13.1
28	*15.0	9.8	9.6	41.7	102	a40	a50	17.0	14.0	84.0	22.2	13.1
29	12.8	9.8	9.8	*21.0	67.8	*a35	249	---------	14.3	109	24.6	14.3
30	12.3	9.8	265	222	45.5	30.0	54.6	---------	14.3	30.4	24.2	13.4
31	11.7	9.8	---------	155	---------	a28	59.7	---------	14.0	---------	25.0	---------
Total	1,060.4	378.3	608.6	1,330.6	4,817.8	5,283.5	2,662.6	1,843.3	674.8	1,471.9	2,339.8	492.9
Mean												
Mgd	34.2	12.2	20.3	42.9	161	170	85.9	65.8	21.8	49.1	75.5	16.4
Cfs	52.9	18.9	31.4	66.4	249	263	133	102	33.7	76.0	117	25.4
Ac-ft	3,250	1,160	1,870	4,080	14,790	16,210	8,170	5,660	2,070	4,520	7,180	1,510

Calendar Year 1964: Max 696 Min 7.9 Mean mgd 57.1 Mean cfs 88.3 Ac-ft 64,150
Fiscal Year 1964-65: Max 720 Min 7.9 Mean mgd 62.9 Mean cfs 97.3 Ac-ft 70,470

Peak discharge (base, 1,400 mgd, revised)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
9-30	2000	9.24	3,990	6,170	1-10	0200	7.08	1,830	2,830
12-16	1400	8.87	3,550	5,490	5-14	1230	6.90	1,690	2,610
12-19	0030	7.54	2,220	3,430					

* Discharge measurement made on this day.
a No gage-height record.

170. Koaie Stream at altitude 3,770 ft, near Waimea

Location.--Lat 22°06'57", long 159°33'53", on left bank 3 miles upstream from Left Branch, 6.5 miles east of Kokee ranger station, and 12.7 miles northeast of Waimea.

Drainage area.--3.33 sq mi.

Records available.--July 1919 to July 1932, June 1954 to June 1965. Prior to July 1962, published as "at altitude 3,700 ft, near Waimea."

Gage.--Water-stage recorder. Altitude of gage is 3,770 ft (from topographic map).

Average discharge.--24 years, 17.9 mgd (27.7 cfs).

Extremes.--Maximum discharge during year, 2,920 mgd (4,520 cfs) Sept. 30 (gage height, 4.88 ft), from rating curve extended above 700 mgd; minimum, 1.69 mgd (2.61 cfs) Apr. 23-25.
1919-32, 1954-65: Maximum discharge, 4,210 mgd (6,510 cfs) Oct. 23, 1956 (gage height, 5.88 ft), from rating curve extended above 350 mgd; minimum, 0.6 mgd (0.9 cfs) May 21, 22, 1929.

Remarks.--Records fair. No diversion above station.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.5	1.69	1.1	62.0
.6	3.91	1.3	112
.7	8.50	1.6	220
.8	16.5	2.0	435
.9	28.0		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	12.8	11.7	3.34	42.1	92.1	9.12	5.82	7.91	4.23	5.82	10.5	8.50
2	23.4	47.6	4.58	11.2	98.7	7.91	4.96	5.37	29.8	15.5	388	12.0
3	20.0	6.81	12.8	7.35	88.6	5.82	31.6	45.1	24.6	35.0	369	6.30
4	14.5	4.23	5.37	5.82	129	4.96	7.35	55.9	7.91	9.77	16.5	6.81
5	10.5	3.91	3.34	38.2	126	4.23	40.0	106	5.37	199	26.8	5.37
6	38.1	5.82	3.08	46.8	68.0	3.34	87.0	38.9	3.91	155	9.77	4.23
7	20.6	3.62	2.59	24.6	163	3.08	9.77	52.6	3.34	54.6	5.37	3.34
8	53.3	11.3	2.17	10.5	145	3.08	7.35	15.5	3.08	15.5	3.62	2.59
9	13.6	14.5	2.59	7.35	59.4	4.96	83.8	23.4	3.34	9.12	2.83	2.17
10	9.77	4.23	*4.96	8.50	29.5	189	145	9.77	17.5	83.3	2.37	1.99
11	8.50	2.83	6.81	6.81	13.6	167	8.50	7.35	7.35	16.5	2.17	1.83
12	25.1	4.23	11.2	4.96	17.5	101	19.2	7.35	4.58	9.77	2.17	7.70
13	12.8	6.30	6.81	3.91	25.7	104	91.2	7.35	3.62	220	18.2	29.6
14	6.30	18.8	11.2	*3.08	10.5	121	9.12	5.82	3.34	8.50	143	40.1
15	25.5	16.5	6.81	8.92	13.1	32.5	6.30	4.58	*2.83	4.96	9.12	25.0
16	56.8	9.77	96.7	9.12	26.8	148	5.82	4.96	2.83	3.91	5.37	10.5
17	16.5	953	15.5	4.58	23.4	21.1	12.8	4.23	2.59	3.34	4.23	7.91
18	12.8	8.50	32.5	17.6	15.5	139	7.35	3.91	2.37	2.83	3.08	5.37
19	8.50	18.6	7.91	24.6	29.8	107	4.96	4.23	2.17	2.37	3.34	8.50
20	6.81	5.82	24.1	12.0	10.5	31.3	5.71	6.30	1.99	2.17	4.58	9.12
21	*5.82	3.91	11.2	6.81	35.7	29.5	28.5	7.91	1.99	1.99	3.62	5.82
22	7.91	3.08	7.35	6.30	184	28.5	9.12	8.50	1.99	1.99	2.83	4.58
23	159	10.4	7.91	20.5	*14.5	115	5.37	10.5	5.82	1.83	2.17	3.62
24	52.5	5.37	7.35	38.7	9.77	14.5	5.37	31.0	6.81	1.69	1.99	4.23
25	83.5	4.23	4.96	14.5	220	9.77	*4.96	16.5	6.81	2.59	*1.83	3.34
26	22.2	3.34	3.91	32.5	75.4	6.81	3.62	8.50	4.58	36.1	9.16	2.59
27	7.35	2.59	3.08	31.0	17.6	5.82	3.91	6.30	3.34	43.0	5.82	2.37
28	5.37	2.37	3.08	24.6	13.6	4.96	5.37	4.58	3.08	28.0	8.72	24.7
29	4.23	2.17	3.62	14.5	8.50	4.58	16.5	---------	3.62	63.0	28.6	9.12
30	3.91	1.99	375	93.7	6.81	4.96	10.5	---------	21.5	38.0	24.6	4.58
31	4.96	1.99	---------	197	---------	14.5	18.8	---------	24.2	---------	16.0	---------
Total	752.93	341.81	691.82	778.11	1,771.58	1,446.30	705.63	510.32	220.49	1,075.15	1,135.36	263.88
Mean												
Mgd	24.3	11.0	23.1	25.1	59.1	46.7	22.8	18.2	7.11	35.8	36.6	8.80
Cfs	37.6	17.0	35.7	38.8	91.4	72.3	35.3	28.2	11.0	55.4	56.6	13.6
Ac-ft	2,310	1,050	2,120	2,390	5,440	4,440	2,170	1,570	677	3,300	3,480	810

Calendar Year 1964: Max 555 Min 1.43 Mean mgd 28.4 Mean cfs 43.9 Ac-ft 31,920
Fiscal Year 1964-65: Max 388 Min 1.69 Mean mgd 26.6 Mean cfs 41.2 Ac-ft 29,760

* Discharge measurement made on this day.

Peak discharge (base, 900 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
9-30	2030	4.88	2,920	4,520	4- 5	1830	3.43	1,480	2,290
12-10	1030	2.79	952	1,470	4-13	0400	3.91	1,910	2,960
12-16	1330	3.09	1,190	1,840	5- 2	1400	4.87	2,910	4,500
1-10	0030	3.18	1,260	1,950					

190. Waialae Stream at altitude 3,820 ft, near Waimea

Location.--Lat 22°05'20", long 159°34'18", on left bank 5.0 miles northeast of mouth and 10.6 miles northeast of Waimea.

Drainage area.--2.5 sq mi, approximately.

Records available.--January 1920 to July 1932, June 1952 to June 1965. Prior to July 1954, published as Waialae River at altitude 3,700 ft, near Waimea and July 1954 to June 1963 as "at altitude 3,700 ft, near Waimea." See also Note below.

Gage.--Water-stage recorder. Altitude of gage is 3,820 ft (from topographic map).

Average discharge.--25 years, 14.1 mgd (21.8 cfs).

Extremes.--Maximum discharge during year, 1,990 mgd (3,080 cfs) Sept. 30 (gage height, 6.90 ft), from rating curve extended above 720 mgd as explained below; minimum, 1.49 mgd (2.31 cfs) Mar. 22, 23.

1920-32, 1952-65: Maximum discharge, 2,930 mgd (4,530 cfs) Jan. 16, 1921 (gage height, 8.44 ft), from rating curve extended above 720 mgd on basis of slope-area measurement at gage height 4.60 ft; minimum, 0.7 mgd (1.1 cfs) Mar. 18-20, 1925, June 14, 15, 1931.

Remarks.--Records fair except those for period of no gage-height record, which are poor. No diversion above station.

Note.--Published records for high-water periods in fiscal years 1921 and 1954, and figures of maximum discharge for the fiscal years 1921-32, 1953-54, have been found to be in error; revised records are on file in the district office and will be published in the next water-supply paper.

Rating table (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used Sept. 8-30)

0.9	1.58	1.4	17.5
1.0	2.85	1.6	35.5
1.1	4.70	2.0	96.0
1.2	7.30	2.5	205
1.3	11.4	3.0	341

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	9.35	6.52	2.70	34.1	110	8.94	5.48	5.22	2.56	3.40	7.71	6.00
2	14.4	36.9	3.04	7.04	120	7.71	4.96	3.78	9.76	16.0	257	6.78
3	10.6	6.26	6.52	5.22	100	6.26	32.3	14.7	8.94	28.3	225	4.52
4	7.71	4.70	3.78	4.14	150	5.48	6.52	27.5	4.14	6.78	23.9	4.52
5	6.52	4.14	2.85	22.2	150	4.96	62.6	84.0	3.04	163	38.2	3.78
6	29.4	5.22	2.70	24.7	80	4.33	96.2	15.7	2.42	149	10.2	3.22
7	13.7	4.33	2.28	11.0	200	3.96	9.76	22.3	2.28	41.6	6.78	2.70
8	31.7	7.81	1.80	5.74	150	3.78	7.30	7.30	2.03	10.2	5.48	2.28
9	7.71	11.7	1.91	5.22	70	4.70	93.8	9.76	1.91	6.52	4.52	2.15
10	6.26	4.70	*3.04	4.96	25	92.0	97.1	5.48	3.78	85.6	4.14	2.03
11	4.96	3.78	4.14	4.33	13	107	8.94	4.52	3.78	15.7	4.96	1.93
12	12.6	4.70	5.22	3.59	18	63.5	29.8	4.33	2.56	11.3	4.33	6.51
13	7.71	6.26	4.14	2.85	25	123	93.5	4.33	2.28	175	43.5	21.7
14	5.22	13.8	5.48	2.70	11	129	9.76	3.78	2.15	8.94	149	38.3
15	19.0	11.4	3.96	*4.70	15	33.5	6.78	3.40	1.91	6.00	13.8	16.2
16	35.2	7.71	72.1	5.22	18	133	7.04	3.04	*1.80	4.70	7.04	8.94
17	9.35	94.0	6.78	3.59	20	23.0	13.2	2.85	1.80	4.14	5.74	6.00
18	8.12	7.04	13.4	15	14	153	6.78	2.70	1.69	3.78	4.96	4.70
19	6.00	12.6	4.70	20	20	132	5.22	2.70	1.58	3.22	7.71	6.52
20	5.22	5.48	10.2	10	10	44.6	7.60	3.22	1.58	3.04	7.04	5.48
21	4.52	4.33	6.00	6.2	50	30.1	19.1	3.40	1.58	2.85	5.22	4.33
22	*5.48	3.59	3.96	5.0	200	43.1	6.52	3.59	1.58	2.56	4.33	3.59
23	97.0	6.00	3.96	15	17	11.8	4.96	4.14	2.15	2.42	3.78	2.85
24	51.6	4.70	4.70	30	*11.0	16.9	4.33	9.35	2.85	2.28	3.40	3.22
25	92.8	3.96	3.78	12	287	10.2	3.96	6.78	2.70	3.40	3.22	2.56
26	17.5	3.22	2.85	25	97.7	7.30	*3.59	4.52	2.42	14.0	*6.54	2.28
27	8.12	2.85	2.42	20	24.7	6.26	3.78	3.78	1.91	19.9	5.22	2.28
28	6.26	2.42	2.28	16	15.7	5.74	3.96	2.85	1.80	12.0	4.70	14.0
29	5.48	2.28	2.70	70	10.6	5.22	6.00	---------	1.80	36.7	16.9	6.00
30	5.22	2.15	164	100	8.12	6.26	5.74	---------	11.0	32.4	12.6	3.59
31	4.96	2.03	---------	202	---------	9.76	10.2	---------	12.2	---------	10.2	---------
Total	549.67	296.58	357.39	697.50	2040.82	1342.56	676.78	269.02	103.98	874.73	907.12	198.96
Mean												
Mgd	17.7	9.57	11.9	22.5	68.0	43.3	21.8	9.61	3.35	29.2	29.3	6.63
Cfs	27.4	14.8	18.4	34.8	105	67.0	33.7	14.9	5.18	45.2	45.3	10.3
Ac-ft	1690	910	1100	2140	6260	4120	2080	826	319	2680	2780	611

Calendar Year 1964: Max 461 Min 1.49 Mean mgd 24.1 Mean cfs 37.3 Ac-ft 27,120
Fiscal Year 1964-65: Max 287 Min 1.58 Mean mgd 22.8 Mean cfs 35.3 Ac-ft 25,520

* Discharge measurement made on this day.
Note.--No gage-height record Oct. 18 to Nov. 23.

Peak discharge (base, 840 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
9-30	2200	6.90	1,990	3,080	4-13	0400	6.36	1,680	2,600
12-16	1330	5.54	1,270	1,960	5- 3	1030	6.74	1,890	2,920
1- 9	2330	5.09	1,070	1,660					

220. Kekaha ditch at Camp 1, near Waimea

Location.--Lat 22°02'35", long 159°38'30", on right bank 0.2 mile downstream from lower intake and 6.2 miles northeast of Waimea.

Records available.--May 1908 to February 1909, April, June, September, November 1909, January 1910 to June 1915, March 1916 to August 1917, October 1917 to June 1965. Prior to January 1910 and August 1932 to June 1933 monthly discharge only, published in WSP 1319; figures of daily discharge for latter period published in WSP 755 are unreliable. Published as "at intake, near Waimea" January 1910 to December 1911 and as "at Flume No. 4, near Waimea" March 1916 to June 1917.

Gage.--Water-stage recorder. Altitude of gage is 520 ft (by barometer). Prior to July 12, 1921, staff gage at several sites within 1 mile of present site at various datums.

Average discharge.--52 years (1910-15, 1916-17, 1918-24, 1925-65), 36.5 mgd (56.5 cfs).

Extremes.--1908-65: Maximum daily discharge, 67 mgd (104 cfs) Jan. 6, Mar. 3, 6, 7, 17, 18, 24-26, 29-31, 1921; no flow at times.

Remarks.--Records good. Ditch diverts from Waimea River 1 mile downstream from Waialae Stream for irrigation in vicinity of Kekaha.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	49.8	32.1	28.2	45.0	35.0	22.5	31.6	6.62	45.7	44.5	31.6	49.8
2	50.0	36.3	31.6	41.4	44.6	32.8	31.6	6.06	48.9	43.7	30.9	50.5
3	41.7	47.5	39.2	30.2	35.9	31.6	31.9	6.56	50.5	37.4	30.9	50.3
4	27.0	38.3	38.3	31.6	43.7	31.4	31.6	6.57	49.6	37.5	32.1	43.6
5	26.8	33.7	26.4	39.5	32.6	31.6	30.8	12.0	44.9	46.7	32.1	32.6
6	30.8	36.5	26.8	48.6	32.6	31.4	27.6	13.0	37.2	48.4	32.3	36.5
7	49.8	35.3	27.0	48.4	33.7	31.9	31.9	12.6	38.5	49.8	32.6	50.5
8	46.0	31.4	*27.7	48.4	33.7	31.9	32.1	26.7	42.2	50.0	32.6	49.6
9	49.8	36.0	26.8	39.5	32.8	31.4	31.9	30	41.1	43.6	32.3	48.0
10	43.0	40.1	29.1	31.2	32.1	31.4	19.1	30	38.9	33.0	33.0	45.9
11	31.9	32.8	32.6	31.8	37.9	32.3	15.4	30.7	.04	36.5	32.6	39.1
12	35.8	31.4	31.9	35.3	46.3	32.3	17.3	30.7	.04	49.8	31.9	33.5
13	49.8	37.6	32.6	31.9	42.8	31.9	17.3	32.3	.03	32.8	32.3	36.8
14	40.7	41.5	40.4	30.0	32.3	31.6	15.4	32.1	.02	32.6	26.1	50.5
15	42.8	33.7	42.0	30.5	36.4	31.4	16.2	32.8	.01	32.3	30.8	50.0
16	49.8	36.1	44.0	40.1	49.3	29.6	16.8	36.9	.01	32.1	32.1	51.0
17	43.2	48.9	47.7	30.7	50.0	31.9	16.8	36.7	.46	31.9	31.9	51.0
18	31.9	49.3	43.3	35.7	48.9	31.9	15.0	37.2	2.21	31.9	32.3	45.1
19	33.5	49.3	30.2	48.4	49.3	29.3	15.0	36.5	8.40	32.1	32.1	32.1
20	38.8	47.5	34.6	48.0	42.5	32.1	15.4	32.6	8.40	31.9	*32.3	35.5
21	35.1	39.7	47.7	40.8	32.6	31.6	16.2	34.4	29.8	31.9	32.6	49.8
22	38.5	34.6	38.8	35.1	30.9	31.4	14.4	37.4	36.0	31.9	32.3	48.6
23	42.5	38.5	44.1	34.4	32.6	29.6	14.8	37.2	38.0	31.6	32.6	47.0
24	44.2	44.7	39.7	30.2	31.6	31.4	14.8	41.6	46.8	31.6	32.6	46.8
25	37.7	36.7	35.3	35.0	29.9	31.4	14.8	49.1	*44.7	26.3	32.6	42.6
26	39.5	33.7	30.9	48.4	31.4	31.4	15.0	43.4	38.4	25.6	32.3	37.4
27	49.3	31.6	29.1	47.7	32.3	31.9	15.0	32.8	31.9	31.9	35.5	38.3
28	*48.4	30.0	28.4	48.0	32.1	31.6	12.4	35.3	32.8	31.6	35.5	44.1
29	42.9	28.9	28.0	48.6	32.1	*32.1	9.35	---------	36.7	31.4	32.6	50.3
30	39.4	28.2	38.7	42.6	24.8	32.1	12.6	---------	42.4	31.4	35.8	47.0
31	35.5	27.5	---------	31.9	---------	33.2	9.16	---------	49.3	---------	49.3	---------
Total	1265.9	1149.4	1041.1	1208.9	1102.7	969.9	609.21	799.81	883.92	1083.7	1018.5	1333.8
Mean												
Mgd	40.8	37.1	34.7	39.0	36.8	31.3	19.7	28.6	28.5	36.1	32.9	44.5
Cfs	63.1	57.4	53.7	60.3	56.9	48.4	30.5	44.3	44.1	55.9	50.9	68.9
Ac-ft	3.880	3.530	3.200	3.710	3.380	2.980	1.870	2.450	2.710	3.330	3.130	4.090

Calendar Year 1964:	Max	51.0	Min	0.01	Mean mgd	36.3	Mean cfs	56.2	Ac-ft	40.780
Fiscal Year 1964-65:	Max	51.0	Min	0.01	Mean mgd	34.2	Mean cfs	52.9	Ac-ft	38.260

* Discharge measurement made on this day.

291. Waimea ditch below wasteway, near Waimea

Location.--Lat 21°59'10", long 159°39'59", on left bank at tunnel No. 4 outlet and below wasteway, 1.3 miles downstream from intake, and 2 miles north of Waimea.

Records available.--February 1960 to June 1965.

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 131.2 ft above mean sea level (by stadia survey).

Average discharge.--5 years, 2.89 mgd (4.47 cfs).

Extremes.--1960-65: Maximum daily discharge, 8.91 mgd (13.8 cfs) Mar. 11, 12, 1965; no flow at times.

Remarks.--Records good. Ditch diverts from Waimea River for irrigation of sugarcane in vicinity of Waimea.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	7.12	3.81	1.34	8.64	3.48	0.02	0	0	3.05	4.48	2.24	4.48
2	5.60	2.63	1.45	6.96	6.26	0	.48	0	5.92	4.69	1.13	4.48
3	7.29	3.84	.96	4.76	5.04	0	1.02	0	7.83	3.47	.01	4.14
4	7.20	3.16	1.60	2.41	.43	*.01	1.93	0	7.04	.02	.37	4.07
5	3.49	2.30	4.97	1.03	.35	.02	3.96	0	4.41	4.55	.32	4.00
6	1.53	2.08	4.14	7.83	.29	.01	2.51	0	4.69	6.16	.06	3.81
7	*5.22	2.36	3.81	6.64	.27	0	.01	0	4.14	4.14	.45	3.03
8	5.70	2.54	2.78	4.90	.27	0	.01	0	2.08	4.14	.61	2.72
9	3.29	4.30	2.19	2.19	.24	0	.48	0	2.55	4.00	.53	2.36
10	2.90	3.88	2.13	2.78	.18	.16	1.16	0	7.28	4.07	.39	2.08
11	2.78	*2.19	2.54	2.72	.14	.24	.05	0	8.91	4.20	.53	1.91
12	2.77	1.69	4.14	.88	.10	.24	.08	1.49	8.91	4.14	1.12	3.36
13	5.61	1.91	5.84	.16	.10	.24	.20	4.00	5.30	1.84	1.02	5.60
14	2.35	3.10	3.94	.02	.05	.21	.02	4.07	2.66	.29	1.02	*6.08
15	3.24	5.60	4.83	1.23	.03	.18	.02	2.57	3.67	.77	.88	6.96
16	6.72	3.87	6.68	3.74	1.99	1.41	.02	3.02	6.97	1.17	.83	5.76
17	7.12	4.90	*8.61	4.90	5.14	.98	.01	*3.26	5.79	.98	.83	6.16
18	4.97	7.47	6.87	4.15	6.00	.35	.01	4.69	.50	.88	.78	5.60
19	1.38	5.68	3.68	7.65	6.16	.05	.01	4.00	.29	.69	.73	6.96
20	2.64	5.28	.21	6.72	5.60	.02	.01	3.94	.29	3.55	.69	7.20
21	2.54	.05	5.10	4.83	5.46	.02	.01	3.94	.14	4.27	.50	6.16
22	2.42	1.26	4.55	*3.94	3.48	.01	*0	4.07	0	1.80	.46	4.20
23	4.44	1.96	4.07	3.88	1.74	.02	0	5.18	0	.88	.46	3.62
24	7.74	3.98	3.55	5.60	1.58	.01	0	4.54	*0	1.25	1.13	3.22
25	5.29	2.42	3.22	3.10	2.13	.01	0	.01	2.02	1.62	3.55	3.55
26	1.58	1.96	3.55	4.49	1.36	0	0	.01	2.72	*2.06	4.34	4.90
27	4.10	1.85	2.42	6.88	.14	0	0	4.67	4.00	3.03	4.48	4.27
28	4.27	1.69	2.19	6.64	.08	0	0	6.56	3.42	2.78	4.20	3.94
29	3.48	1.64	2.19	5.92	.05	0	0	---------	2.54	2.78	4.83	7.47
30	2.72	1.53	3.10	4.37	.02	0	0	---------	2.66	2.60	3.26	5.46
31	2.48	1.85	---------	3.03	---------	0	0	---------	6.76	---------	4.22	---------
Total	129.98	92.78	106.65	132.99	58.16	4.21	12.00	60.02	116.54	81.30	45.97	137.55
Mean												
Mgd	4.19	2.99	3.56	4.29	1.94	0.136	0.387	2.14	3.76	2.71	1.48	4.58
Cfs	6.48	4.63	5.51	6.64	3.00	0.210	0.599	3.31	5.82	4.19	2.29	7.09
Ac-ft	399	285	327	408	178	13	37	184	358	250	141	422

Calendar Year 1964:	Max	8.64	Min	0	Mean mgd	2.69	Mean cfs	4.16	Ac-ft	3,020
Fiscal Year 1964-65:	Max	8.91	Min	0	Mean mgd	2.68	Mean cfs	4.15	Ac-ft	3,000

* Discharge measurement or observation of no flow made on this day.

310. Waimea River near Waimea

Location.--Lat 21°59'02", long 159°39'46", on right bank 1.2 miles upstream from Makaweli River and 1.8 miles north of Waimea.

Drainage area.--57.8 sq mi.

Records available.--July 1910 to June 1918, July to October 1919, November 1943 to June 1965.

Gage.--Water-stage recorder. Altitude of gage is 25 ft (by hand levels from mouth of Makaweli River). Prior to Oct. 5, 1911, staff gage at site 1 mile downstream at different datum. Oct. 5, 1911, to Oct. 31, 1919, staff gage at present site at different datum.

Average discharge.--28 years (1911-18, 1944-65), 88.3 mgd (137 cfs).

Extremes.--Maximum discharge during year, 8,720 mgd (13,500 cfs) Dec. 16 (gage height, 12.45 ft), from rating curve extended above 3,400 mgd as explained below; minimum, 0.33 mgd (0.51 cfs) Sept. 11.
1910-19, 1943-65: Maximum discharge, 24,000 mgd (37,100 cfs) Feb. 7, 1949 (gage height, 19.3 ft), from rating curve extended above 3,400 mgd on basis of slope-area measurements at gage heights 10.28 and 18.7 ft; practically no flow occasionally owing to upstream diversions.

Remarks.--Records fair except those for periods of no gage-height record, which are poor. Several upstream diversions for power and irrigation.

Rating tables (gage height, in feet, and discharge, in million gallons a day)

July 1 to Dec. 16

2.5	0.25	3.8	28.0
2.6	.45	4.2	59.0
2.7	.80	4.6	109
2.8	1.30	5.0	190
2.9	2.00	5.5	350
3.1	4.20	6.0	600
3.3	7.90	7.0	1,350
3.5	13.8	8.0	2,310

Dec. 17 to June 30

3.3	2.90	4.7	100
3.4	4.40	5.1	185
3.6	8.50	5.5	320
3.8	15.2	6.0	560
4.1	32.0	7.0	1,320
4.4	58.0	8.0	2,310

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	12.1	1.93	1.30	370	292	89.8	64.0	107	7.35	5.66	67.6	40.4
2	6.16	60.2	.85	39.8	564	73.6	55.0	90.4	83.6	8.50	750	60
3	18.3	16.7	1.00	21.1	834	623	1.010	187	62.1	50.6	1.060	30
4	29.3	1.51	6.14	14.2	394	*53.6	61.6	295	25.2	82.0	198	70
5	17.0	1.00	4.52	14.4	469	47.6	248	642	8.04	328	210	90
6	48.4	.70	2.66	125	344	41.2	1.530	241	8.50	504	145	50
7	*14.5	1.00	2.38	55.4	767	36.0	238	368	7.81	165	114	10
8	148	1.30	1.30	23.0	972	32.6	142	122	5.84	55.0	95.2	13
9	20.0	20.3	.73	6.85	436	31.9	229	122	4.58	28.1	70.0	15
10	7.69	4.15	.66	9.72	163	921	2.120	71.4	68.5	175	62.8	25
11	8.16	*1.25	.59	9.46	84.6	874	284	68.8	62.8	134	103	30
12	4.92	1.10	2.86	4.08	55.4	557	262	56.0	40.4	47.2	95.2	20
13	23.4	1.00	7.90	2.57	67.8	415	929	44.6	45.4	1.120	95.0	40
14	4.00	3.93	2.16	2.00	54.5	664	262	39.5	44.6	136	2.300	*57.8
15	5.26	32.6	1.79	1.37	37.5	192	188	37.2	38.8	77.0	460	83.5
16	97.5	23.6	112	.85	105	1.740	165	45.4	32.8	58	300	24.4
17	39.4	135	*68.1	2.28	70.0	464	160	*36.5	32.0	48.0	214	20.0
18	16.6	42.4	23.5	14.2	47.6	1.210	153	17.1	37.2	38.0	150	10.9
19	14.6	16.0	43.2	*63.4	72.8	1.940	128	13.7	28.8	30.0	170	17.6
20	2.79	22.9	13.5	19.2	37.5	470	109	18.6	28.8	22.8	150	15
21	.90	4.84	23.8	2.10	100	430	214	21.6	17.8	19.5	100	8.0
22	.70	1.93	2.57	.80	1.410	270	130	18.1	4.94	18.1	82	4.0
23	584	1.15	1.79	9.03	202	1.110	93.6	18.6	4.10	17.1	90	4.5
24	194	2.57	1.51	44.6	105	324	82.6	39.6	*10.9	14.8	50	6.0
25	326	1.44	1.25	52.7	1.740	208	75.6	91.0	8.50	15.7	25	7.0
26	191	1.10	1.25	72.9	1.340	160	68.8	25.5	4.40	*190	60	7.6
27	32.8	1.10	1.10	141	330	130	65.2	21.6	5.48	190	40	6.0
28	8.72	1.05	.85	84.8	227	113	75.6	13.4	4.58	109	35	5.0
29	2.38	1.00	.76	24.7	143	95.2	287	---------	3.95	209	120	25
30	1.44	1.20	838	282	114	81.2	113	---------	4.25	102	71.4	7.0
31	1.05	1.20	---------	648	---------	82.6	104	---------	31.0	---------	70.0	---------
Total	1.881.07	407.15	1.170.02	2.161.51	11.578.7	12.919.6	9.647.0	2.872.6	773.02	3.998.06	7.553.2	802.7
Mean												
Mgd	60.7	13.1	39.0	69.7	386	417	311	103	24.9	133	244	26.8
Cfs	93.9	20.3	60.3	108	597	645	481	159	38.5	206	378	41.5
Ac-ft	5.770	1.250	3.590	6.630	35.530	39.650	29.600	8.820	2.370	12.270	23.180	2.460

Calendar Year 1964:	Max	2.170	Min	0.45	Mean mgd	130	Mean cfs	201	Ac-ft	145.500
Fiscal Year 1964-65:	Max	2.300	Min	0.59	Mean mgd	153	Mean cfs	237	Ac-ft	171.100

Peak discharge (base, 5,600 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
9-30	2130	11.33	6,860	10,600	1-10	0200	12.36	8,570	13,300
12-16	1500	12.45	8,720	13,500	4-13	0530	10.74	5,940	9,190

* Discharge measurement made on this day.

Note.--No gage-height record Apr. 16, May 16, 18-29, June 2-13, 20-30.

360. Makaweli River near Waimea

Location.--Lat 21°58'31", long 159°38'55", on left bank 0.7 mile upstream from mouth and 1.9 miles northeast of Waimea.

Drainage area.--25 sq mi, approximately.

Records available.--July 1943 to June 1965. Records for October 1911 to June 1917 at site 0.2 mile downstream not equivalent owing to intervening diversion.

Gage.--Water-stage recorder. Datum of gage is 18.2 ft above mean sea level (by stadia survey). July 27, 1943, to June 15, 1959, at datum 1.00 ft higher.

Average discharge.--21 years (1944-65), 56.4 mgd (87.3 cfs).

Extremes.--Maximum discharge during year, 8,340 mgd (12,900 cfs) May 3 (gage height, 11.16 ft), from rating curve extended above 2,100 mgd as explained below; minimum recorded, 9.96 mgd (15.4 cfs) Aug. 11.

1943-65: Maximum discharge, 10,300 mgd (15,900 cfs) Apr. 15, 1963 (gage height, 12.25 ft), from rating curve extended above 2,100 mgd on basis of slope-area measurement at gage height 10.65 ft; minimum (corrected), 2.05 mgd (3.15 cfs) July 19, 1951.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Olokele ditch diverts all low flow from Olokele River 9 miles above station for irrigation near Makaweli.

Rating tables (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used Oct. 22-30)

July 1 to Aug. 16

0.3	8.40	2.0	126
.4	11.0	2.5	215
.7	21.2	3.0	340
1.1	40.5	4.0	690
1.5	70.5		

Aug. 17 to June 30

0.3	10.0	2.5	245
.4	12.5	3.0	365
.6	20.0	4.0	710
1.0	42.0	5.0	1,240
1.5	87.0	6.0	1,950
2.0	155		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	24.3	14.7	15.2	80	418	131	70	30	21.5	30.5	50.5	36.0
2	28.2	111	12.0	30	476	106	60	27	35.5	25.5	1280	39.3
3	19.3	19.4	28.5	25	387	100	176	25	46.6	65.8	1350	35
4	18.5	13.1	15.3	20	525	*75.1	70	60	22.5	45.6	243	30
5	15.7	11.6	12.0	85	456	36.6	398	171	20	371	272	35
6	71.3	21.4	11.8	70	272	31.2	768	35	18	584	139	30
7	*21.6	11.6	11.2	150	381	28.0	170	25	17	263	78.7	25
8	86.5	42.4	11.2	35	537	27.0	117	23	16	85.3	80	20
9	25.8	54.0	20.2	30	284	27.0	542	21	15	88.9	50	18
10	19.8	14.0	16.8	20	124	107	1240	20	16	410	40	17
11	13.1	*10.7	15.3	16	54.6	216	167	19	17	126	35	30
12	32.4	25.0	13.9	15	119	161	209	19	15	67.2	32	62.2
13	26.8	17.4	20.2	14	150	298	468	19	14	970	91.5	66.6
14	13.1	17.4	25.0	13	43.7	530	155	18	13	115	775	134
15	54.8	23.3	22.3	45	31.2	192	118	18	12	49.0	142	*120
16	75.2	31.5	262	20	40.6	826	104	18	12	34.2	74.0	73.9
17	26.3	230	*56.1	14	28.5	205	118	17	12	29.0	64	41.4
18	27.9	41.5	62.8	12	25.5	415	82.6	17	13	25.0	52	31
19	15.4	40.5	29.0	11	38.9	646	77.1	*19.3	13	22.5	104	35
20	13.7	21.5	56	10	23.5	231	79.3	24.0	15	21.5	74.0	40
21	11.6	16.8	24	11	96.2	223	120	27.5	14	21.5	45	30
22	12.5	15.0	20	*12.2	1110	159	76.0	26.5	13	20.5	40	22
23	145	26.8	24	33.7	142	572	82.6	27.0	12	19.2	70	19
24	181	16.8	28	69.1	67.0	270	109	26.0	12	18.0	45	20
25	384	14.2	18	20.6	974	121	70	31.2	12	20.0	35	18
26	139	13.6	15	19.2	760	90	60	26.5	*11.5	54.7	78.6	17
27	42.0	12.5	14	20.0	209	80	50	24.0	11.5	69.3	40	20
28	21.2	12.0	13	51.9	144	72	45	22.5	11.8	57.8	50	85.5
29	17.4	11.8	12	18.0	96.6	80	40	---------	12.5	126	75.8	40
30	16.0	11.5	120	58.6	96.6	65	35	---------	134	131	85.4	20
31	15.4	11.2	---------	779	---------	110	40	---------	159	---------	68.4	---------
Total	1614.8	934.2	1004.8	1808.3	8110.9	6230.9	5916.6	836.5	767.4	3967.0	5659.9	1210.9
Mean												
Mgd	52.1	30.1	33.5	58.3	270	201	191	29.9	24.8	132	183	40.4
Cfs	80.6	46.6	51.8	90.2	418	311	296	46.3	38.4	204	283	62.5
Ac-ft	4960	2870	3080	5550	24890	19120	18160	2570	2360	12170	17370	3720

Calendar Year 1964:	Max	1880	Min	10	Mean mgd	94.4	Mean cfs	146	Ac-ft	106100
Fiscal Year 1964-65:	Max	1350	Min	10	Mean mgd	104	Mean cfs	161	Ac-ft	116800

Peak discharge (base, 3,000 mgd, revised)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
9-30	about 2100	7.82	3,630	5,620	1- 5	2230	7.44	3,220	4,980
11-22	0600	7.86	3,680	5,690	1- 9	2400	11.09	8,220	12,700
12-16	1400	9.71	6,020	9,310	4-13	0600	10.82	7,770	12,000
					5- 3	1200	11.16	8,340	12,900

* Discharge measurement made on this day.

Note.--No gage-height record Sept. 20 to Oct. 21, Dec. 26 to Jan. 2, Jan. 4, Jan. 25 to Feb. 4, Feb. 6-18, Mar. 5-25, May 8-12, 17, 18, 21-25, 27, 28, June 3-11, 18-27, 29, 30.

490. Hanapepe River below Manuahi Stream, near Eleele

Location.--Lat 21°57'29", long 159°33'13", on left bank 200 ft downstream from Manuahi Stream and 4 miles northeast of Eleele.

Drainage area.--18.8 sq mi.

Records available.--July 1917 to January 1921, December 1926 to June 1965. Prior to July 1952, published as "at Koula, near Eleele." Records for August 1910 to December 1916 at site half a mile upstream not equivalent owing to inflow. See also Note below.

Gage.--Water-stage recorder. Datum of gage is 222 ft above mean sea level (by stadia survey). July 1, 1917, to Jan. 22, 1921, staff gage and Dec. 16, 1926, to June 30, 1951, water-stage recorder, at same site at datum 1.00 ft higher.

Average discharge.--41 years (1917-20, 1927-65), 55.0 mgd (85.1 cfs).

Extremes.--Maximum discharge during year, 7,090 mgd (11,000 cfs) May 3 (gage height, 9.34 ft), from rating curve extended above 840 mgd on basis of slope-area measurement at gage height 14.87 ft; minimum, 10.0 mgd (15.5 cfs) June 11, 12.
1917-21, 1926-65: Maximum discharge, 25,200 mgd (39,000 cfs) Apr. 15, 1963 (gage height, 14.87 ft), from rating curve extended above 4,900 mgd on basis of slope-area measurement of peak flow; minimum, 3.3 mgd (5.1 cfs) May 21, 1954.

Remarks.--Records good. Hanapepe ditch diverts 3 miles above station for irrigation in vicinity of Makaweli.

Note.--The figures of maximum discharge for fiscal years 1918-21, 1927-60 have been found to be in error; revised records are on file in the district office and will be published in the next water-supply paper.

Rating tables (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used July 1-25, May 8 to June 30)

July 1-25

0.7	16.5	2.0	180
.8	21.5	2.5	310
1.1	44.0	3.0	485
1.5	90.0		

July 25 to June 30

0.7	10.0	2.5	252
.8	14.0	3.0	400
1.1	31.0	4.0	810
1.5	68.5	5.0	1,420
2.0	143		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	37.2	21.0	16.4	142	552	48.5	35.7	22.2	12.8	11.6	48.5	40.5
2	34.8	112	14.9	32.8	826	38.8	31.8	14.9	14.0	14.9	771	35.7
3	32.5	22.8	26.6	30.0	536	34.9	75.4	14.9	32.5	24.1	905	25.2
4	30.2	18.7	16.4	17.8	542	27.8	35.7	21.2	12.8	16.8	258	23.3
5	31.0	17.3	14.0	99.0	445	25.8	250	89.2	12.8	217	344	23.3
6	90.5	28.1	16.4	76.8	228	24.5	444	22.2	12.8	438	111	17.8
7	41.7	16.8	14.5	175	366	23.3	104	17.8	12.8	193	*61.9	15.4
8	106	69.6	13.6	40.5	497	22.2	*102	16.4	12.8	46.5	60.5	14.0
9	*55.8	53.6	33.3	38.6	218	25.2	292	*14.9	12.8	64.7	40.5	10.8
10	31.0	22.8	27.1	25.8	*106	27.8	579	14.5	12.8	468	29.7	10.8
11	21.5	18.2	18.2	18.2	71.0	82.1	113	14.0	13.6	127	24.5	10.0
12	31.0	40.1	21.6	16.8	146	78.3	142	14.0	13.6	63.0	22.8	24.2
13	21.5	25.8	19.3	15.9	128	242	260	14.0	12.8	578	45.4	43.9
14	21.5	38.8	34.5	14.9	66.3	437	98.0	13.6	12.8	60.0	390	100
15	61.0	29.0	23.3	50.3	52.5	128	82.4	13.6	12.8	32.6	76.8	*107
16	107	69.6	313	22.2	47.5	463	76.0	13.6	12.8	23.3	39.7	74.5
17	29.5	*232	53.6	16.4	38.8	124	81.0	13.2	12.8	19.3	32.6	34.4
18	51.6	43.2	79.7	15.9	31.8	224	66.3	12.8	13.2	16.8	29.7	23.3
19	28.0	59.6	29.7	15.4	36.5	372	65.2	12.8	13.2	15.4	89.8	23.9
20	21.5	25.2	67.4	14.5	26.4	116	83.6	12.8	13.2	14.0	74.2	45.9
21	20.5	20.4	*30.4	16.8	47.0	89.2	76.0	13.2	13.2	14.0	35.7	21.0
22	21.0	18.2	23.9	17.3	527	66.5	60.8	12.8	*13.2	13.6	33.8	15.4
23	218	29.6	30.7	31.7	71.0	208	72.7	12.8	12.8	13.6	63.0	13.2
24	347	17.3	30.6	44.2	44.9	69.8	216	12.8	12.4	13.2	35.7	13.6
25	457	16.4	20.4	17.8	367	48.5	74.8	12.8	12.4	16.9	25.2	11.2
26	163	15.9	17.8	21.0	414	41.4	63.0	12.4	12.4	43.2	71.1	11.2
27	47.5	14.5	16.4	18.7	121	38.8	46.6	12.4	12.4	50.1	32.6	12.8
28	29.7	14.5	15.9	22.8	69.8	43.2	41.4	12.4	12.4	55.4	46.9	85.3
29	23.9	14.5	15.4	21.6	54.5	32.6	34.9	---------	12.8	192	74.9	23.8
30	21.0	14.0	135	111	40.5	57.7	34.1	---------	19.3	127	88.8	13.2
31	22.2	14.5	---------	839	---------	46.6	32.6	---------	36.3	---------	67.0	---------
Total	2,255.6	1,154.0	1,190.0	2,040.7	6,717.5	3,307.5	3,770.0	484.2	449.3	2,983.0	4,030.3	924.6
Mean												
Mgd	72.8	37.2	39.7	65.8	224	107	122	17.3	14.5	99.4	130	30.8
Cfs	113	57.6	61.4	102	347	166	189	26.8	22.4	154	201	47.7
Ac-ft	6,920	3,540	3,650	6,260	20,620	10,150	11,570	1,490	1,380	9,150	12,370	2,840

Calendar Year 1964: Max 1,350 Min 7.38 Mean mgd 90.1 Mean cfs 139 Ac-ft 101,100
Fiscal Year 1964-65: Max 905 Min 10.0 Mean mgd 80.3 Mean cfs 124 Ac-ft 89,940

* Discharge measurement made on this day.

Peak discharge (base, 2,300 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-25	1500	6.07	2,730	4,220	1- 5	2300	7.58	4,190	6,480
10-31	1430	6.11	2,410	3,730	1-10	0030	6.83	3,220	4,980
11- 4	1500	6.49	2,820	4,360	4-13	0430	7.90	4,650	7,190
12-14	0500	6.36	2,680	4,150	5- 3	1230	9.34	7,090	11,000
12-16	1430	8.62	5,780	8,940					

525. Lawai Stream near Koloa

Location.--Lat 21°54'03", long 159°30'19", on right bank at private road bridge, 0.9 mile upstream from mouth, and 2.6 miles southwest of Koloa.

Drainage area.--6.60 sq mi.

Records available.--Fiscal years 1962-63 (annual maximum), July 1963 to June 1965.

Gage.--Water-stage recorder. Datum of gage is 37.0 ft above mean sea level (by stadia survey). Apr. 24, 1962, to June 30, 1963, crest-stage gage at same site and datum.

Extremes.--Maximum discharge during year, 1,280 mgd (1,980 cfs) Nov. 8 (gage height, 7.80 ft), from rating curve extended above 43 mgd as explained below; minimum, 0.79 mgd (1.22 cfs) Oct. 21.
1962-65: Maximum discharge, 2,290 mgd (3,540 cfs) Mar. 14, 1963 (gage height, 9.56 ft), from rating curve extended above 43 mgd on basis of slope-area measurements at gage heights 7.70 and 9.56 ft.
1963-65: Minimum discharge, 0.17 mgd (0.26 cfs) Dec. 25, 1963.

Remarks.--Records poor. Several diversions above station for irrigation of sugarcane.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.46	2.56	2.95	9.94	69.3	11.6	10.1	5.03	1.6	1.46	1.82	12.5
2	3.45	1.97	3.45	3.58	124	7.70	9.50	2.66	1.8	1.46	40.0	12.2
3	2.56	1.97	3.20	3.32	127	*7.90	16.20	2.46	2.1	1.2	10.2	9.10
4	2.07	2.07	2.66	2.95	84.1	8.30	8.90	2.95	2.0	1.09	20.2	9.10
5	1.75	1.97	2.56	5.92	46.4	7.70	34.2	13.3	1.9	1.5	56.7	8.10
6	2.85	2.26	2.56	3.32	47.5	7.16	78.1	6.62	1.9	2.5	8.10	6.98
7	2.36	2.17	2.46	3.82	95.5	6.98	15.0	5.39	1.9	2.0	5.22	5.22
8	4.27	2.66	2.36	2.75	131	8.70	11.4	3.70	1.9	1.46	4.08	3.08
9	*2.46	1.97	2.85	2.56	43.6	9.10	37.7	*2.75	1.9	1.3	3.58	2.7
10	2.17	1.75	2.85	2.46	31.8	7.52	131	2.36	1.8	5.0	3.32	2.5
11	2.07	1.82	2.85	1.97	23.0	14.6	16.8	2.17	1.8	10	2.95	*2.75
12	1.90	1.90	2.75	1.90	20.7	15.4	27.2	2.36	1.8	3.5	2.85	3.08
13	1.90	1.75	2.85	1.68	20.7	42.6	46.0	1.97	1.7	*44.4	3.08	3.20
14	2.07	*1.97	3.70	1.60	16.3	69.4	16.5	1.97	1.7	2.56	16.8	2.66
15	2.56	1.75	2.95	1.97	14.0	48.3	14.5	1.90	1.7	2.07	9.91	3.08
16	4.32	4.79	6.62	1.68	12.5	75.7	12.5	1.90	1.7	1.82	7.70	2.95
17	2.56	5.39	3.95	1.46	9.10	30.7	12.7	1.82	1.68	1.68	7.34	2.75
18	2.26	4.20	4.54	1.31	4.71	21.2	10.5	1.75	1.60	1.60	6.98	2.66
19	1.68	4.88	3.20	1.14	7.34	52.5	9.70	1.7	1.53	1.68	9.64	2.56
20	1.82	3.45	3.82	.94	9.50	22.0	10.4	1.8	1.75	1.75	9.58	2.46
21	1.90	3.45	*3.20	.94	9.30	19.8	11.0	1.7	1.53	1.60	4.37	2.66
22	1.82	2.95	3.58	*.99	40.9	16.1	8.50	1.6	*1.60	1.60	2.46	2.46
23	15.0	2.95	8.34	1.31	11.8	23.5	7.90	1.6	1.53	1.68	11.0	2.36
24	8.77	2.95	4.37	1.24	9.50	15.2	13.4	1.8	1.46	1.46	4.55	2.17
25	10.6	3.95	3.82	1.24	59.3	13.6	8.12	1.7	1.53	1.53	2.75	2.07
26	3.45	2.95	3.58	3.27	92.0	12.5	6.08	1.6	1.53	2.07	7.26	2.07
27	2.56	3.08	3.45	3.62	24.1	11.6	3.58	1.7	1.5	*1.60	7.70	2.17
28	2.36	3.08	3.45	1.75	16.8	11.0	3.82	1.7	1.4	1.53	6.00	2.95
29	2.56	3.45	3.82	3.54	13.8	10.3	4.37	---------	1.5	2.56	6.44	2.26
30	2.56	2.56	14.4	20.9	11.8	10.3	4.20	---------	1.6	2.46	26.7	2.17
31	2.56	2.66	---------	64.0	---------	9.91	4.20	---------	2.0	---------	11.0	---------
Total	103.68	87.28	117.14	159.07	1227.35	628.87	604.07	79.96	52.94	108.12	320.28	122.97
Mean												
Mgd	3.34	2.82	3.90	5.13	40.9	20.3	19.5	2.86	1.71	3.60	10.3	4.10
Cfs	5.17	4.36	6.03	7.94	63.3	31.4	30.2	4.43	2.65	5.57	15.9	6.34
Ac-ft	318	268	359	488	3,770	1,930	1,850	245	162	332	983	377

Calendar Year 1964: Max 166 Min 0.28 Mean mgd 9.85 Mean cfs 15.2 Ac-ft 11,070
Fiscal Year 1964-65: Max 131 Min 0.94 Mean mgd 9.90 Mean cfs 15.3 Ac-ft 11,080

Peak discharge (base, 730 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
11- 2	1900	6.84	826	1,280	1-10	0130	6.87	838	1,300
11- 8	0300	7.80	1,280	1,980	5- 2	1700	6.70	770	1,190
12-16	1500	7.55	1,160	1,790					

* Discharge measurement made on this day.
Note.--No gage-height record Feb. 19 to Mar. 16, Mar. 27-31, Apr. 3, 5-7, 9-12, June 9, 10.

534. Upper Haiku ditch near Puhi

Location.--Lat 21°58'48", long 159°27'12", on right bank 20 ft upstream from flume crossing a tributary to Kamooloa Stream, 0.8 mile downstream from intake on Papuaa Stream, and 3.6 miles west of Puhi.

Records available.--October 1963 to June 1965.

Gage.--Water-stage recorder (digital). Altitude of gage is 470 ft (from topographic map).

Extremes.--1963-65: Maximum daily discharge, 19.0 mgd (29.4 cfs) July 2, 1964; minimum daily, 0.02 mgd (0.03 cfs) for several days in January and April 1965.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Ditch diverts from Papuaa Stream at Papuaa Reservoir and from Kamooloa Stream at intake 300 ft above Puuana Road crossing for irrigation of sugarcane in vicinity of Puhi.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	18.0	2.00	12.8	12	0.9	0.19	0.02	0.17	7.5	0.07	0.37	0.87
2	19.0	2.07	12.8	9.0	1.0	.21	.02	.26	7.2	.48	3.64	5.68
3	12.8	11.9	14.3	2.0	.9	*.17	.03	.05	6.8	.87	2.52	8.84
4	2.34	17.2	10.1	1.5	.8	.10	.02	5.0	10	.87	2.45	6.68
5	1.94	15.8	2.34	10	*.67	.07	2.60	2.45	9.3	1.37	4.21	.97
6	2.07	15.8	2.34	12	.6	.06	4.98	.19	.2	.87	.87	.78
7	16.1	*11.2	2.20	14	2.0	.04	.17	.07	.2	.23	.52	8.06
8	18.8	2.40	12.1	12	10	.04	.21	.04	6.3	.19	.37	7.64
9	16.5	2.40	15.0	10	.3	.17	.37	.03	6.3	.19	.23	6.80
10	12.6	12.6	*14.1	4.0	.17	.21	3.11	.04	6.6	1.79	.15	6.68
11	5.19	14.7	10.6	2.0	.41	.87	.12	.04	4.3	4.63	.09	5.68
12	5.19	15.4	1.61	2.0	.87	.87	.74	.05	.1	1.43	.04	2.60
13	12.8	13.7	1.50	7.0	1.11	2.94	*1.02	.05	.3	2.38	.34	.23
14	13.5	10.2	12.4	4.0	.52	2.68	.12	.05	.3	.12	*1.79	7.64
15	14.5	1.83	14	5.0	.31	1.25	.06	1.16	2.3	.05	.29	9.48
16	13.4	3.64	15	3.5	.23	3.02	.04	*8.4	.7	.03	.19	7.78
17	10.4	10.7	13	2.0	.17	.71	.06	8.0	.5	.03	.14	7.78
18	3.82	6.21	10	*2.45	.12	1.43	.03	10	2.7	.03	1.49	6.18
19	3.82	11.9	2.5	2.5	1.85	2.60	.02	9.0	1.1	.03	.52	1.85
20	12.6	14.3	2.0	3.0	3.83	.63	.12	.3	.3	1.49	.21	2.60
21	11.9	10.9	3.0	2.5	3.83	.48	.08	.3	.2	1.92	.34	6.80
22	13.5	3.06	9.0	2.0	6.68	.15	.02	7.5	2.1	1.11	.14	*7.64
23	12.8	3.73	10	2.5	2.08	.78	.02	9.3	2.4	1.16	.26	9.48
24	5.86	12.6	8.0	1.0	1.92	.23	1.92	7.5	.3	.02	.15	10.5
25	11.7	11.9	5.0	1.0	2.77	.19	.21	8.8	.4	.21	3.74	9.98
26	3.82	10.1	2.0	1.5	2.30	.14	.03	8.7	.3	8.36	4.21	5.32
27	13.0	9.20	1.5	1.3	.31	.10	.02	.3	.3	9.64	3.83	1.73
28	13.4	7.33	5.0	5.0	.12	.12	.04	.3	.3	9.32	3.28	13.2
29	12.6	3.14	9.0	10	.15	.07	.12	---------	*3.5	4.12	.45	11.1
30	11.2	3.06	10	8.0	.15	.07	.17	---------	9.8	1.06	.56	12.2
31	9.95	11.4	---------	.8	---------	.08	.14	---------	1.8	---------	.45	---------
Total	335.10	282.37	243.19	155.55	47.07	20.67	16.63	88.05	94.4	54.07	37.84	192.77
Mean												
Mgd	10.8	9.11	8.11	5.02	1.57	0.667	0.536	3.14	3.05	1.80	1.22	6.43
Cfs	16.7	14.1	12.5	7.77	2.43	1.03	0.829	4.86	4.72	2.79	1.89	9.95
Ac-ft	1030	867	746	477	144	63	51	270	290	166	116	592

Calendar Year 1964:	Max	19.0	Min	0.04	Mean mgd	6.01	Mean cfs	9.33	Ac-ft	6750		
Fiscal Year 1964-65:	Max	19.0	Min	0.02	Mean mgd	4.30	Mean cfs	6.65	Ac-ft	4810		

* Discharge measurement made on this day.

Note.--No gage-height record Sept. 15 to Oct. 17, Oct. 19 to Nov. 4, Nov. 6-9, Feb. 3, 4, Feb. 16 to Mar. 31.

536. Lower Haiku ditch near Puhi

Location.--Lat 21°58'19", long 159°27'12", on right bank 300 ft upstream from flume crossing a tributary to Kamooloa Stream, 0.5 mile downstream from intake on Kamooloa Stream, and 3.2 miles west of Puhi.

Records available.--October 1963 to June 1965.

Gage.--Water-stage recorder. Altitude of gage is 400 ft (from topographic map).

Extremes.--1963-65: Maximum daily discharge, 32.8 mgd (50.7 cfs) May 27, 1964, May 5, 1965; minimum daily, 1.18 mgd (1.83 cfs) Dec. 5, 1963.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Ditch diverts from Kamooloa Stream 0.4 mile below Papuaa Stream for irrigation of sugarcane in vicinity of Puhi.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.20	3.80	2.80	4.30	23.1	8.51	7.99	8.77	2.60	3.90	13.8	13.5
2	3.40	4.80	2.60	3.30	23.5	11.9	7.99	7.86	2.80	4.10	22.8	11.9
3	3.40	a4.0	3.20	2.80	23.4	*14.5	9.38	6.90	3.40	2.40	25.9	8.25
4	3.00	a3.9	2.60	2.50	21.2	13.8	7.20	12.1	2.80	2.10	23.0	9.22
5	2.90	a3.8	2.50	5.96	18.8	13.8	11.6	26.9	2.60	3.77	32.8	10.3
6	3.60	a4.5	2.40	7.76	17.8	13.2	28.1	15.3	2.50	5.10	24.2	9.54
7	3.50	*3.50	2.30	9.29	21.9	13.0	16.5	13.5	2.40	4.90	20.4	7.00
8	5.40	3.60	2.20	7.50	25.5	13.0	15.9	12.5	2.40	3.90	17.7	5.30
9	5.20	3.90	2.80	6.70	14.2	14.2	16.2	12.1	2.40	3.80	15.3	4.80
10	4.40	3.50	*2.70	6.70	12.1	14.2	25.8	11.9	2.70	7.81	13.5	4.70
11	3.50	3.10	2.60	6.30	11.1	20.3	15.3	11.0	2.30	19.6	10.9	4.50
12	3.50	3.30	2.40	5.90	12.1	21.4	17.1	10.5	2.30	13.8	8.82	5.10
13	3.40	3.10	2.10	4.20	13.0	26.9	*22.0	9.70	2.10	22.4	13.9	8.90
14	3.30	3.60	2.40	2.90	10.9	27.6	14.2	9.06	2.00	12.1	*23.7	8.25
15	4.10	4.20	2.30	4.10	10.0	a25	14.5	7.60	2.00	10.3	14.8	9.86
16	4.90	16.5	5.30	3.60	9.38	a25	14.5	*5.45	2.10	10.2	14.2	7.00
17	3.70	7.75	3.30	2.90	8.38	a18	14.5	3.80	2.00	9.86	13.2	5.10
18	4.20	4.40	3.30	*3.00	8.25	a21	13.8	3.70	2.00	9.38	12.1	4.50
19	3.60	5.40	2.70	2.90	9.70	a21	13.0	3.60	2.00	8.64	15.9	7.20
20	3.80	4.00	3.10	3.10	10.2	a15	13.0	3.10	1.90	6.81	14.2	9.38
21	3.30	3.80	2.90	2.90	10.5	a14	13.5	3.00	1.80	4.30	18.6	7.00
22	3.40	3.60	3.30	2.80	19.6	a14	11.9	3.00	1.70	5.00	13.8	*4.80
23	10.0	4.40	4.40	3.70	10.7	a12	11.3	3.00	1.70	4.90	14.2	4.36
24	10.0	4.00	3.70	5.25	9.70	a14	14.7	2.90	1.70	5.30	12.8	4.00
25	20.1	3.70	2.90	3.30	17.9	a14	12.5	2.80	1.70	8.60	7.00	3.50
26	10.5	3.30	2.60	4.10	24.1	a14	12.3	2.70	1.60	13.0	7.20	3.20
27	7.86	3.00	2.50	3.40	10.9	a14	12.3	2.60	1.53	12.8	9.22	3.20
28	6.40	2.90	2.50	4.50	9.86	a12	12.3	2.60	1.46	17.4	10.2	5.78
29	5.80	2.70	2.40	11.6	9.06	11.7	11.3	---------	*1.53	15.6	13.5	3.50
30	4.80	2.90	4.30	13.6	8.64	11.3	10.9	---------	2.80	16.5	13.8	3.30
31	4.40	3.10	---------	14.3	---------	10.2	10.5	---------	4.60	---------	13.0	---------
Total	162.56	132.05	87.10	165.16	435.47	492.51	432.06	217.94	69.42	268.27	484.44	196.94
Mean												
Mgd	5.24	4.26	2.90	5.33	14.5	15.9	13.9	7.78	2.24	8.94	15.6	6.56
Cfs	8.11	6.59	4.49	8.25	22.4	24.6	21.5	12.0	3.47	13.8	24.1	10.1
Ac-ft	499	405	267	507	1,340	1,510	1,330	669	213	823	1,490	604

Calendar Year 1964:	Max	32.8	Min	2.00	Mean mgd	8.67	Mean cfs	13.4	Ac-ft	9,730		
Fiscal Year 1964-65:	Max	32.8	Min	1.46	Mean mgd	8.61	Mean cfs	13.3	Ac-ft	9,660		

* Discharge measurement made on this day.
a No gage-height record.

538. Kamooloa Stream near Puhi

Location.--Lat 21°58'13", long 159°27'08", on right bank at head of falls, 0.4 mile upstream from confluence with Kuia Stream, and 3.5 miles west of Puhi.

Drainage area.--5.94 sq mi.

Records available.--November 1963 to June 1965.

Gage.--Water-stage recorder. Altitude of gage is 390 ft (from topographic map).

Extremes.--Maximum discharge during year, 2,750 mgd (4,250 cfs) Dec. 16 (gage height, 6.66 ft), from rating curve extended above 390 mgd on basis of slope-area measurements at gage heights 4.86 and 6.66 ft; minimum, 0.05 mgd (0.08 cfs) Sept. 8-12, 15, 28, 29.
1963-65: Maximum discharge, that of Dec. 16, 1964; minimum, that of Sept. 8-12, 15, 28, 29, 1964.
Revisions.--The maximum discharge for the period November 1963 to June 1964 has been revised to 1,490 mgd (2,310 cfs) Jan. 5, 1964 (gage height, 5.10 ft), superseding figure published in Surface Water Records of Hawaii and other Pacific Areas (1964).

Remarks.--Records good except those for period of no gage-height record, which are fair, and for period of shifting control, which are poor. Kamooloa ditch diverts 4.3 miles above station into Kuia Stream. Upper Haiku ditch (see p. 20) and Lower Haiku ditch (see preceding page) divert 1.3 miles and 0.4 mile, respectively, above station for irrigation of sugarcane near Puhi.

Revisions.--Revised figures of discharge for some peak discharges in the period November 1963 to June 1964, superseding those published in Surface Water Records of Hawaii and other Pacific Areas (1964), are given herewith: Jan. 5 (0130) 1,490 mgd (2,310 cfs), 5.10 ft; Mar. 8 (2000) 870 mgd (1,350 cfs), 4.12 ft.

Rating table, except for period of shifting control
(gage height, in feet, and discharge, in million gallons a day)

0.1	0.05	1.0	6.00
.2	.23	1.1	8.80
.3	.52	1.6	56.0
.5	1.35	2.0	120
.7	2.55	2.5	230
.9	4.40		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.10	0.12	0.23	0.18	117	a8.8	1.46	2.29	0.56	0.79	5.52	7.12
2	.12	.46	.23	.06	187	a6.0	1.30	1.84	.67	1.26	21.3	6.04
3	.12	.12	.21	.07	169	a4.4	2.03	1.74	1.26	.75	189	2.36
4	.10	.12	.18	.07	158	*2.36	1.30	*8.35	.67	.63	102	3.06
5	.10	.12	.10	.76	100	1.79	111	*91.7	.49	1.66	208	3.60
6	.18	.16	.07	.71	77.5	1.30	142	30.2	.49	1.96	48.3	2.80
7	.14	*.12	.07	36.5	94.0	.90	22.6	22.8	.49	1.74	33.4	2.03
8	.36	.23	.06	7.27	162	.82	17.3	15.0	.42	1.17	23.8	1.96
9	.26	.26	*.05	2.48	58.8	3.80	39.5	13.4	.36	.99	16.5	1.79
10	.21	.18	.05	4.00	42.0	4.20	123	11.1	.31	10.4	7.12	1.74
11	.16	.14	.05	3.80	39.0	28.1	18.6	10.3	.31	45.1	3.90	1.62
12	.23	.12	.06	1.52	50.5	31.8	42.5	9.57	.31	*5.36	4.98	1.90
13	.16	.10	.06	.33	56.0	104	*51.2	5.28	.28	*123	15.6	2.98
14	.16	.18	.06	.23	40.0	132	19.7	1.96	.28	*11.1	64.6	2.29
15	.18	.18	.06	.39	34.2	56.0	12.6	1.90	.28	5.52	21.8	3.23
16	.23	4.92	1.86	.31	21.8	*144	8.80	*1.57	.23	4.00	13.4	1.52
17	.16	2.88	.09	.33	7.96	36.0	11.1	1.26	.21	2.89	8.24	1.26
18	.14	.31	.10	*.31	6.56	48.3	7.68	*1.12	.23	2.16	4.20	1.17
19	.12	.36	.06	.26	8.87	97.9	5.04	1.08	.23	1.84	19.7	1.57
20	.10	.31	.10	.18	.49	32.6	11.0	1.12	.23	1.62	11.9	4.17
21	.09	.28	.10	.21	1.78	30.2	8.52	1.08	.23	*1.46	18.5	1.62
22	.09	.28	.09	.21	135	22.8	4.40	.79	.18	1.30	6.56	*1.04
23	5.85	.33	.21	.28	35.0	40.0	3.50	.67	.18	1.26	15.0	.82
24	11.1	.31	.14	.58	31.0	16.5	81.1	.79	.18	.63	6.84	1.04
25	59.2	.31	.12	.28	112	10.3	16.5	.56	.16	4.34	3.04	.82
26	18.6	.31	.10	.28	150	8.24	6.84	.46	.12	11.1	2.22	.90
27	1.96	.28	.10	.33	a45	7.68	6.56	.63	.09	9.04	2.03	1.04
28	.18	.26	.07	.33	a31	4.80	6.28	.63	.10	7.64	3.78	1.48
29	.16	.26	.06	15.1	a22	.49	3.50	---------	.09	32.5	10.3	.82
30	.14	.23	.09	27.8	a13	.47	3.40	---------	*.60	24.9	12.6	.71
31	.12	.26	---------	52.8	---------	1.30	3.23	---------	*1.37	---------	9.57	---------
Total	100.82	14.50	4.83	157.96	2,006.46	887.85	793.54	239.19	11.61	318.11	913.70	64.50
Mean												
Mgd	3.25	0.468	0.161	5.10	66.9	28.6	25.6	8.54	0.375	10.6	29.5	2.15
Cfs	5.03	0.724	0.249	7.89	104	44.3	39.6	13.2	0.580	16.4	45.6	3.33
Ac-ft	309	44	15	485	6,160	2,720	2,440	734	36	976	2,800	198

Calendar Year 1964: Max 260 Min 0.05 Mean mgd 15.4 Mean cfs 23.8 Ac-ft 17,320
Fiscal Year 1964-65: Max 208 Min 0.05 Mean mgd 15.1 Mean cfs 23.4 Ac-ft 16,920

Peak discharge (base, 900 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
11- 8	0200	4.8	1,280	1,980	1- 5	2300	5.40	1,700	2,630
12-14	0600	5.01	1,430	2,210	4-13	0500	4.86	1,320	2,040
12-16	1430	6.66	2,750	4,250	5- 2	1700	6.57	2,670	4,130

* Discharge measurement made on this day.
a No gage-height record.
Note.--Shifting-control method used Mar. 20-31.

542. Koloa ditch near Koloa

Location.--Lat 21°57'07", long 159°28'11", on right bank at old county road bridge, 250 ft downstream from wasteway, and 3.0 miles north of Koloa.

Records available.--July 1964 to June 1965.

Gage.--Water-stage recorder (digital). Altitude of gage is 620 ft (from topographic map).

Extremes.--Maximum daily discharge, 85.8 mgd (133 cfs) Apr. 13; minimum daily, 1.49 mgd (2.31 cfs) Nov. 6.

Remarks.--Records fair. Ditch diverts from Kuia Stream just below the Waiahi-Kuia aqueduct for power generation and irrigation of sugarcane near Koloa.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	16.9	19.0	15.3	33.4	45.0	8.54	10.9	19.0	12.7	12.1	55.6	19.0
2	17.3	25.9	16.9	16.5	12.7	8.54	9.70	20.5	16.1	18.1	58.4	18.6
3	20.0	17.7	22.0	16.9	7.12	*8.54	23.0	15.3	36.8	34.5	22.7	13.8
4	24.1	16.1	17.3	11.5	4.52	8.38	10.7	27.1	14.5	24.0	19.7	14.1
5	25.9	16.5	13.6	33.4	*1.67	7.90	38.4	33.4	13.3	24.4	5.82	14.4
6	46.0	20.5	14.2	45.0	1.49	7.77	57.6	12.4	13.3	44.3	5.12	12.6
7	32.1	15.7	13.3	64.8	1.60	8.22	16.5	11.1	13.0	35.7	13.6	12.6
8	53.0	25.9	13.0	41.6	2.32	9.50	13.0	10.5	12.7	38.5	18.3	13.8
9	30.2	24.1	*20.0	34.7	4.20	11.8	14.5	10.5	12.1	45.2	18.0	13.4
10	19.0	19.0	21.0	25.3	4.52	11.8	20.0	10.7	12.7	81.0	24.8	13.1
11	16.5	16.5	18.5	17.7	5.50	15.3	13.9	10.3	12.4	68.6	17.3	12.4
12	17.7	21.0	19.0	*16.1	7.51	16.9	14.9	9.90	12.7	63.3	12.4	16.7
13	14.9	20.0	17.7	12.7	7.90	20.5	*18.1	10.1	12.7	*85.8	*14.4	23.6
14	16.1	26.5	23.5	10.3	7.12	15.3	13.0	9.70	12.1	54.6	3.20	24.4
15	23.0	24.1	21.0	23.0	6.60	7.25	11.3	9.70	11.5	33.2	2.88	32.0
16	34.0	40.8	45.0	16.1	6.38	7.25	10.1	*9.90	11.5	21.9	3.40	24.0
17	20.0	39.2	20.0	9.70	6.27	7.25	10.1	9.70	11.3	21.5	7.54	18.0
18	24.1	18.1	32.8	9.90	6.38	11.3	8.70	10.7	10.9	25.7	14.1	16.4
19	18.5	23.5	23.5	10.9	7.12	16.9	9.34	12.4	11.3	20.4	25.2	20.8
20	18.1	15.7	34.0	12.7	6.27	12.4	12.4	10.1	11.3	16.1	18.3	24.0
21	17.7	14.9	22.0	13.9	6.99	11.8	14.5	9.90	10.7	14.6	14.9	*17.3
22	19.0	15.7	26.5	14.2	11.1	10.9	16.9	10.9	10.3	11.9	11.9	17.0
23	60.0	18.5	34.7	22.5	8.06	15.7	24.7	13.3	42.4	11.2	17.0	14.9
24	63.6	14.2	26.5	27.1	7.51	14.2	45.0	13.3	64.8	10.1	15.8	15.5
25	69.9	16.1	19.5	18.5	10.9	11.3	30.8	13.3	44.0	18.6	14.9	15.5
26	30.8	14.9	16.9	22.0	10.3	9.50	34.0	13.3	*14.5	37.0	24.8	14.9
27	28.3	13.6	14.5	21.5	6.05	9.34	32.8	13.3	11.5	51.8	19.4	15.8
28	24.1	13.0	14.5	30.2	5.72	11.8	34.7	13.0	10.3	64.4	27.2	30.8
29	*22.5	13.0	13.9	52.0	5.61	11.8	25.9	---------	9.70	65.4	33.2	21.1
30	20.0	13.6	29.5	41.3	7.38	11.1	22.0	---------	13.6	67.5	15.5	16.7
31	20.5	14.2	---------	47.0	---------	11.8	18.5	---------	16.9	---------	14.6	---------
Total	863.8	607.5	640.1	772.40	231.81	350.58	635.94	373.30	523.60	1121.4	569.96	537.2
Mean												
Mgd	27.9	19.6	21.3	24.9	7.73	11.3	20.5	13.3	16.9	37.4	18.4	17.9
Cfs	43.2	30.3	33.0	38.5	12.0	17.5	31.7	20.6	26.1	57.9	28.5	27.7
Ac-ft	2650	1860	1960	2370	711	1080	1950	1150	1610	3440	1750	1650

Calendar Year 1964:	Max	-	Min	-	Mean mgd	-	Mean cfs	-	Ac-ft	-		
Fiscal Year 1964-65:	Max	85.8	Min	1.49	Mean mgd	19.8	Mean cfs	29.9	Ac-ft	22180		

* Discharge measurement made on this day.

545. Kuia Stream near Puhi

Location.--Lat 21°58'07", long 159°27'15", on right bank 0.2 mile downstream from Weoweopilau Stream and 3.6 miles west of Puhi.

Drainage area.--5.04 sq mi.

Records available.--November 1963 to June 1965.

Gage.--Water-stage recorder. Datum of gage is 393.27 ft above mean sea level (Grove Farm Co., Inc. bench mark).

Extremes.--Maximum discharge during year, 1,780 mgd (2,750 cfs) May 2 (gage height, 9.61 ft), from rating curve extended above 420 mgd as explained below; minimum, 0.15 mgd (0.23 cfs) Apr. 19-24.
1963-65: Maximum discharge, 2,770 mgd (4,290 cfs) Jan. 5, 1964 (gage height, 11.30 ft), from rating curve extended above 420 mgd on basis of slope-area measurement of peak flow; minimum, that of Apr. 19-24, 1965.

Remarks.--Records fair. Two miles above station, Kamooloa ditch and Waiahi-Kuia aqueduct divert water into Kuia Stream from Kamooloa and Waiahi Streams. Koloa ditch diverts from Kuia Stream just below inflow, for power generation and irrigation of sugarcane near Koloa. About 0.3 mile above station, water is diverted for use at a rock quarry, with excess emptying into Kamooloa Stream below Lower Haiku ditch.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.00	1.49	0.61	2.54	53.1	10.8	2.52	1.08	0.28	0.25	2.66	11.6
2	1.08	1.49	.54	.85	131	9.23	2.25	1.16	.25	.33	130	12.1
3	1.08	1.08	.61	.93	127	9.23	4.13	.93	.28	.28	107	6.82
4	1.00	1.81	.61	.77	111	7.60	2.14	4.56	.25	.28	82.8	6.63
5	1.00	1.08	.54	2.38	60.8	6.82	58.4	40.1	.22	.38	*203	6.82
6	2.25	1.27	.54	3.06	54.2	6.27	122	12.8	.25	.77	43.0	4.70
7	1.38	.85	.54	8.07	83.9	6.08	19.7	8.60	.25	.54	25.9	3.20
8	4.97	1.49	.54	2.38	159	5.01	11.8	5.01	.22	.33	26.7	2.38
9	1.81	1.49	*.54	2.03	49.9	6.27	26.9	3.06	.25	.38	23.9	2.03
10	1.38	.85	.54	1.81	33.0	6.63	154	1.81	.25	14.8	9.89	1.60
11	1.38	.69	.54	1.38	24.7	19.3	16.0	1.27	.25	6.99	4.07	1.81
12	1.92	.77	.61	*1.16	21.0	20.7	22.6	1.49	.28	2.52	2.72	2.92
13	1.27	.61	.54	.93	23.9	a100	*44.8	.77	.33	*69.5	*7.03	4.70
14	1.16	1.08	.69	.85	18.4	a140	12.1	.61	.28	*6.06	52.2	4.80
15	1.92	1.38	.69	1.49	13.9	a70	8.20	.54	.33	5.75	19.4	6.60
16	2.66	7.64	1.92	1.08	11.8	161	4.86	*.46	.46	9.00	16.2	1.00
17	1.70	3.20	.93	.93	11.1	42	4.23	.46	.38	8.00	10.5	.46
18	1.92	1.92	1.27	1.08	9.92	37	2.14	*.46	.38	.33	4.54	.38
19	1.70	2.38	.77	1.00	*9.23	89.4	2.03	.46	.38	.22	8.65	.54
20	1.49	1.60	1.27	.93	7.40	28.8	7.48	.46	.33	.17	7.09	.69
21	1.27	1.38	.77	.85	7.80	25.9	8.32	.38	.38	.17	3.76	*.38
22	1.16	1.16	.77	.85	74.3	19.4	1.92	.38	.33	.17	2.38	.25
23	10.2	1.38	2.03	1.16	14.5	29.2	.93	.38	.28	.17	15.1	.25
24	6.66	1.08	1.16	1.27	10.6	13.9	39.7	.33	.28	.17	4.86	.61
25	16.8	1.08	.85	.93	68.8	11.6	18.4	.33	.28	.22	2.52	.69
26	14.2	1.00	.69	1.38	145	10.2	6.08	.33	.25	.69	5.42	.61
27	3.33	.77	.54	2.25	30.2	9.00	5.54	.28	.25	1.60	3.33	.77
28	2.66	.69	.46	2.14	20.0	8.60	5.54	.28	.25	.33	5.01	2.79
29	*2.25	.61	.54	10.4	15.4	8.00	3.06	---------	*.25	11.4	7.00	2.25
30	1.92	.61	2.32	17.6	11.3	7.60	2.03	---------	.25	8.65	19.3	1.60
31	1.81	.69	----------	43.7	----------	5.12	1.38	---------	.72	----------	18.1	----------
Total	96.33	44.62	24.97	118.18	1412.15	930.66	621.18	88.78	9.42	150.45	874.03	91.98
Mean												
Mgd	3.11	1.44	0.832	3.81	47.1	30.0	20.0	3.17	0.304	5.02	28.2	3.07
Cfs	4.81	2.23	1.29	5.89	72.9	46.4	30.9	4.90	0.470	7.77	43.6	4.75
Ac-ft	296	137	77	363	4330	2860	1910	272	29	462	2680	282

Calendar Year 1964:	Max	437	Min	0.46	Mean mgd	15.9	Mean cfs	24.6	Ac-ft	17,810
Fiscal Year 1964-65:	Max	203	Min	0.17	Mean mgd	12.2	Mean cfs	18.9	Ac-ft	13,700

* Discharge measurement made on this day.
a No gage-height record.

Peak discharge (base, 1,000 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
12-16	1400	9.40	1,670	2,580	5-2	1630	9.61	1,780	2,750
1- 5	2300	7.94	1,050	1,620					

568. Waiahi-Kuia aqueduct near Puhi

Location.--Lat 21°58'36", long 159°28'28", on left bank 0.2 mile upstream from outlet into Kuia Stream, 4.8 miles west of Puhi, and 5.1 miles north of Koloa School.

Records available.--July 1964 to June 1965.

Gage.--Water-stage recorder and sharp-crested weir. Altitude of gage is 730 ft (from topographic map).

Extremes.--Maximum daily discharge, 48.1 mgd (74.4 cfs) Apr. 13; minimum daily, 1.66 mgd (2.57 cfs) Jan. 2.

Remarks.--Records good. Ditch diverts from Waiahi Stream into Kuia Stream, from which Koloa ditch (see p. 23) diverts a short distance downstream for power generation and irrigation of sugarcane near Koloa.

Cooperation.--Records furnished by Lihue Plantation Co.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	5.48	6.42	7.84	9.74	17.1	6.30	2.15	9.65	5.69	5.48	36.9	5.16
2	5.93	7.24	6.50	8.07	19.5	6.83	1.66	8.30	6.19	10.4	43.6	5.69
3	9.06	6.36	7.91	7.95	16.9	6.59	4.48	6.82	6.65	23.0	29.7	3.11
4	17.0	6.19	6.76	6.54	16.3	5.69	2.06	7.54	6.03	14.1	14.2	3.78
5	18.1	6.08	6.36	9.09	12.9	5.69	9.86	10.8	5.69	7.28	19.6	5.53
6	31.3	6.48	6.71	25.9	9.34	5.53	16.2	7.29	5.86	8.71	10.9	4.69
7	24.0	5.17	6.36	42.7	10.5	6.08	7.54	7.05	5.86	8.21	18.9	4.60
8	31.7	6.26	5.70	26.8	13.0	6.14	5.45	6.65	5.26	23.0	30.9	5.69
9	9.29	6.82	6.54	22.2	9.05	7.35	9.52	6.36	5.05	25.9	30.2	5.75
10	5.86	6.59	*6.36	14.7	6.88	8.22	15.1	6.71	5.05	43.4	17.8	5.59
11	5.69	5.65	6.36	9.66	6.03	10.2	7.07	7.05	5.05	43.9	7.90	5.05
12	5.97	7.38	6.03	*9.52	7.06	10.2	8.69	6.36	5.10	42.2	5.05	6.21
13	5.69	7.77	5.92	7.68	8.04	15.2	9.69	6.36	5.05	*48.1	6.74	7.71
14	5.69	7.07	6.59	6.36	6.49	17.0	6.04	6.36	5.05	*38.9	13.5	7.47
15	6.27	6.42	6.65	8.26	5.48	9.98	3.81	6.36	4.69	*20.5	8.89	7.43
16	6.49	7.92	9.35	7.84	5.87	13.1	2.58	*6.08	4.84	19.2	8.51	6.14
17	5.69	9.05	7.23	6.48	6.31	6.52	2.63	5.69	4.43	15.8	8.51	5.75
18	6.15	7.23	17.2	6.04	6.36	14.7	1.79	6.03	4.43	13.8	7.95	5.81
19	5.69	7.91	18.8	6.20	6.95	15.4	3.62	6.19	4.74	10.2	7.71	5.69
20	6.03	6.71	26.8	6.19	5.20	9.01	7.89	5.86	4.54	8.20	6.59	6.48
21	6.36	6.36	17.3	6.61	6.49	7.96	8.93	5.92	3.84	7.20	7.96	*5.32
22	6.14	6.36	19.3	6.72	16.5	6.03	7.81	6.08	3.84	5.92	6.19	5.05
23	7.79	6.43	21.1	8.03	6.94	7.05	9.47	6.36	16.4	5.75	5.97	5.37
24	8.09	5.86	18.5	8.22	6.36	4.43	18.1	6.36	24.5	5.05	5.80	6.22
25	12.8	5.86	13.7	7.18	13.9	3.71	15.8	6.36	14.9	5.46	5.32	6.82
26	8.71	6.14	11.5	7.54	12.7	2.75	17.5	5.69	6.26	7.23	5.64	6.48
27	6.65	6.36	10.0	7.41	7.95	2.75	15.8	5.69	5.69	26.3	5.05	6.94
28	6.66	6.36	10.2	14.2	6.88	2.97	17.2	5.69	5.00	44.9	7.89	8.08
29	*7.77	6.94	10.1	24.1	6.31	2.22	12.9	---------	*4.64	43.6	8.21	7.77
30	7.29	7.06	10.8	26.9	6.03	1.99	11.3	---------	5.15	45.5	7.11	7.05
31	6.88	7.90	---------	33.6	---------	2.14	10.6	---------	6.82	---------	6.39	---------
Total	302.22	208.35	320.47	398.43	285.32	229.73	273.24	187.66	202.29	627.19	405.58	178.43
Mean												
Mgd	9.75	6.72	10.7	12.9	9.51	7.41	8.81	6.70	6.53	20.9	13.1	5.95
Cfs	15.1	10.4	16.6	20.0	14.7	11.5	13.6	10.4	10.1	32.3	20.3	9.21
Ac-ft	927	639	983	1.220	876	705	839	576	621	1.920	1.240	548

Calendar Year 1964:	Max	-	Min	-	Mean mgd	-	Mean cfs	-	Ac-ft	-		
Fiscal Year 1964-65:	Max	48.1	Min	1.66	Mean mgd	9.91	Mean cfs	15.3	Ac-ft	11.090		

* Discharge measurement made on this day.

600. South Fork Wailua River near Lihue

Location.--Lat 22°02'24", long 159°22'58", on right bank 0.2 mile upstream from Wailua Falls and 4.3 miles north of Lihue.

Drainage area.--22.4 sq mi.

Records available.--December 1911 to April 1919, June 1919 to March 1921, May 1921 to June 1957, August, September 1957, November 1957 to February 1958, June 1958 to June 1965. Monthly discharge only for some periods, published in WSP 1319. Published as "above Waiehu Falls, near Lihue" 1912-13. See also Note below.

Gage.--Water-stage recorder. Altitude of gage is 240 ft (from topographic map). Prior to Nov. 18, 1918, at site 0.3 mile upstream at different datum. Nov. 18, 1918, to June 30, 1957, at site 10 ft downstream from present site at datum 2.50 ft higher and July 1, 1957, to June 23, 1958, at present datum.

Average discharge.--49 years (1912-18, 1919-20, 1921-24, 1925-57, 1958-65), 76.3 mgd (118 cfs).

Extremes.--Maximum discharge during year, 12,200 mgd (18,900 cfs) probably Dec. 16 (gage height, 17.63 ft); minimum, 2.30 mgd (3.56 cfs) Feb. 28.

1911-65: Maximum discharge, 56,400 mgd (87,300 cfs) Apr. 15, 1963 (gage height, 22.90 ft), from rating curve extended above 8,400 mgd on basis of slope-area measurement of peak flow; minimum, 1.09 mgd (1.69 cfs) Sept. 21, 1953.

Remarks.--Records fair except those for period of no gage-height record, which are poor. Lihue and Hanamaulu ditches divert upstream for irrigation of sugarcane in vicinity of Lihue.

Note.--The figures of maximum discharge for fiscal years 1959 and 1960 have been found to be in error; revised records are on file in the district office and will be published in the next water-supply paper.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	10.1	7.10	3.43	18.9	723	*79.2	41.0	*18.5	*5.24	*65.4	95.0	72.0
2	6.74	76.0	3.20	7.10	847	73.6	35.5	9.05	5.40	19.2	949	*75.2
3	5.56	9.89	3.43	7.28	624	75.2	84.0	9.05	11.5	26.5	931	60.5
4	4.92	6.38	3.82	9.68	574	28.8	*39.4	107	6.20	27.9	503	60.5
5	4.76	5.88	3.30	80.3	544	11.8	249	511	4.76	110	905	64.2
6	24.6	7.10	3.10	118	310	14.5	861	134	4.60	292	310	47.6
7	12.5	5.72	3.20	302	429	30.5	155	101	4.47	294	191	40.4
8	23.3	32.3	2.90	73.6	428	31.5	134	58.4	4.34	87.6	157	35.0
9	14.2	44.0	7.60	55.6	282	a50	160	49.6	4.34	54.2	128	24.1
10	9.89	11.5	7.10	31.5	180	a150	722	39.4	4.47	785	60.5	12.5
11	9.89	6.38	3.69	17.9	130	a540	121	34.5	4.60	662	28.3	11.8
12	48.9	7.28	3.10	5.88	264	a430	140	32.5	4.34	175	61.7	11.8
13	12.3	6.38	3.10	4.08	342	a470	299	29.6	4.34	886	114	15.9
14	5.72	5.72	3.69	3.95	198	a900	102	28.3	4.21	142	564	31.9
15	25.4	6.04	3.69	5.40	134	a500	76.0	18.2	4.08	84.9	159	106
16	52.2	151	149	8.00	128	a800	65.0	7.46	4.08	64.2	109	53.4
17	9.47	150	25.3	6.04	93.0	a300	62.8	7.10	4.08	54.2	76.8	27.9
18	41.8	52.2	56.3	12.5	73.6	a1,000	47.0	7.28	4.08	47.0	41.0	14.5
19	21.0	59.1	33.0	23.3	84.9	722	43.4	6.74	4.08	30.1	80.2	7.28
20	11.1	10.6	39.7	35.0	60.5	201	51.6	6.56	4.21	14.2	112	12.8
21	5.72	6.04	16.3	18.9	63.5	150	68.0	6.38	4.08	13.3	142	7.64
22	5.24	5.08	6.38	18.5	491	106	44.0	5.72	3.95	12.0	130	6.38
23	114	19.9	9.89	11.1	106	221	46.2	6.04	3.82	12.8	128	5.88
24	306	12.5	8.42	34.0	72.8	93.0	521	5.88	3.69	27.9	59.8	6.04
25	582	5.08	9.05	29.2	490	76.0	97.0	5.72	3.56	69.9	20.7	5.72
26	261	4.60	8.63	21.4	468	64.2	30.1	5.56	3.43	180	90.9	5.24
27	76.0	5.40	8.84	27.9	180	67.2	12.0	5.40	3.56	167	70.4	5.24
28	31.3	3.69	5.56	44.0	126	76.0	39.4	5.56	3.69	205	72.8	39.3
29	8.21	3.69	4.08	106	99.0	46.4	77.6	---------	3.82	334	105	13.1
30	7.28	3.69	*3.43	199	83.2	38.8	65.0	---------	4.21	214	112	*6.04
31	*7.10	*4.21	---------	672	---------	50.9	48.3	---------	523	---------	104	---------
Total	1,758.20	734.45	442.23	2,008.01	8,628.5	7,397.6	4,537.3	1,261.50	658.23	5,157.3	6,611.1	885.86
Mean												
Mgd	56.7	23.7	14.7	64.8	288	239	146	45.1	21.2	172	213	29.5
Cfs	87.7	36.7	22.7	100	446	370	226	69.8	32.8	266	330	45.6
Ac-ft	5,400	2,250	1,360	6,160	26,480	22,700	13,920	3,870	2,020	15,830	20,290	2,720

Calendar Year 1964:	Max	1,250	Min	2.70	Mean mgd	115	Mean cfs	178	Ac-ft	129,000
Fiscal Year 1964-65:	Max	1,000	Min	2.90	Mean mgd	110	Mean cfs	170	Ac-ft	123,000

* Discharge measurement made on this day.
a No gage-height record.

Peak discharge (base, 3,700 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
probably 12-16	-	17.63	12,200	18,900	4-13	0600	15.56	5,590	8,650
1- 5	2330	16.23	7,200	11,100	5- 2	1730	17.16	10,300	15,900

610. North Wailua ditch near Lihue

Location.--Lat 22°03'55", long 159°28'12", on left bank 300 ft downstream from intake, 8.3 miles west of Wailua, and 8.8 miles northwest of Lihue.

Records available.--July 1932 to June 1965.

Gage.--Water-stage recorder and sharp-crested weir. Datum of gage is 1,105.45 ft above mean sea level (levels by Lihue Plantation Co.).

Average discharge.--33 years, 12.1 mgd (18.7 cfs).

Extremes.--1932-65: Maximum daily discharge, 38 mgd (59 cfs) Dec. 21, 1933, Apr. 24, 1934; no flow at times.

Remarks.--Records good. Ditch diverts from North Fork Wailua River for power and irrigation in vicinity of Lihue.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	13.2	13.5	*15.6	*12.9	16.6	*12.0	3.90	*14.4	12.6	*6.94	13.8	*12.3
2	13.5	14.4	15.6	12.3	15.0	12.3	5.77	14.1	*15.6	8.82	16.2	12.3
3	12.9	*12.9	16.9	13.5	*11.4	12.0	6.61	15.9	15.6	15.3	7.75	12.3
4	13.5	12.9	15.0	12.0	11.3	12.0	1.08	14.1	12.9	14.7	6.29	12.0
5	12.9	13.8	15.9	14.7	12.6	12.0	.67	13.8	12.6	16.6	4.77	12.0
6	15.6	13.5	15.3	12.3	12.0	11.7	.12	12.0	12.0	14.1	.21	11.4
7	14.7	12.9	14.4	12.9	12.6	11.7	0	12.0	12.3	12.9	5.69	11.4
8	14.4	15.6	14.1	11.4	12.6	12.0	.09	13.5	12.0	12.6	13.5	11.1
9	14.4	13.8	16.2	12.0	11.7	13.5	.17	14.4	11.7	14.4	9.10	11.1
10	12.6	14.1	15.3	11.7	11.4	15.0	.10	13.2	13.2	17.2	8.80	11.1
11	11.7	12.9	14.7	11.4	12.3	13.5	0	12.6	12.3	15.3	15.6	11.1
12	14.4	14.4	15.3	11.4	11.4	12.0	2.48	12.6	12.0	13.5	14.7	12.0
13	12.3	13.8	15.0	12.3	11.4	12.0	.07	12.3	11.7	12.6	16.2	12.0
14	12.3	13.5	15.3	12.3	10.6	12.9	0	12.0	11.7	7.40	16.9	13.5
15	13.8	12.3	15.3	13.8	10.8	8.56	0	12.3	11.7	13.5	13.5	12.6
16	15.0	12.0	18.4	12.3	11.4	2.86	0	12.9	11.7	13.5	12.9	12.6
17	12.9	14.4	15.6	12.3	12.6	0	.03	12.6	12.0	13.5	12.6	12.3
18	13.8	12.0	16.9	13.2	12.6	.51	.27	12.6	12.3	13.5	12.9	12.0
19	12.6	14.4	15.3	13.5	12.0	.15	8.08	12.9	12.9	13.5	12.9	12.6
20	12.3	13.5	16.9	13.5	10.6	0	11.7	13.5	12.6	13.5	12.0	12.9
21	13.2	13.5	15.3	14.1	12.6	0	12.3	12.6	12.6	13.5	12.6	11.7
22	12.3	13.2	16.6	13.2	14.4	.08	11.7	12.9	12.6	13.5	12.6	11.7
23	13.8	13.5	15.9	13.8	12.3	.09	16.7	13.2	14.1	13.2	12.3	11.4
24	13.5	12.0	15.6	14.4	12.3	0	19.4	14.7	12.9	13.2	12.0	12.9
25	13.8	13.8	15.6	12.9	12.9	0	13.5	13.2	12.9	15.6	12.0	13.2
26	7.75	14.1	14.7	12.9	11.4	0	15.6	13.2	12.6	17.2	12.9	12.9
27	3.70	13.8	14.4	13.2	10.3	0	16.2	12.6	12.6	18.1	12.3	13.5
28	6.23	13.5	14.4	13.2	9.68	0	15.6	12.6	12.6	16.6	12.6	15.9
29	13.2	14.1	14.7	13.5	8.83	0	15.9	---------	12.9	15.3	12.6	13.8
30	12.9	13.5	16.9	15.0	10.6	0	15.0	---------	17.8	*15.0	13.8	*13.2
31	13.2	15.3	---------	17.5	---------	1.73	15.3	---------	14.7	---------	12.6	---------
Total	392.38	420.9	467.1	405.4	358.21	188.58	208.34	368.7	399.7	414.56	364.61	370.8
Mean												
Mgd	12.7	13.6	15.6	13.1	11.9	6.08	6.72	13.2	12.9	13.8	11.8	12.4
Cfs	19.6	21.0	24.1	20.3	18.4	9.41	10.4	20.4	20.0	21.4	18.3	19.2
Ac-ft	1,200	1,290	1,430	1,240	1,100	579	639	1,130	1,230	1,270	1,120	1,140

Calendar Year 1964:	Max	19.8	Min	0	Mean mgd	12.7	Mean cfs	19.6	Ac-ft	14,220		
Fiscal Year 1964-65:	Max	19.4	Min	0	Mean mgd	11.9	Mean cfs	18.4	Ac-ft	13,370		

* Discharge measurement made on this day.

620. Stable storm ditch near Lihue

Location.--Lat 22°04'09", long 159°26'46", on left bank 100 ft downstream from intake, 7.8 miles northwest of Lihue, and 8.2 miles west of Kapaa.

Records available.--December 1936 to June 1965.

Gage.--Water-stage recorder and sharp-crested weir. Altitude of gage is 710 ft (by barometer).

Average discharge.--28 years (1937-65), 6.96 mgd (10.8 cfs).

Extremes.--1936-65: Maximum daily discharge, 46 mgd (71 cfs) Apr. 3, 1948; no flow at times each year.

Remarks.--Records good. Ditch diverts from North Fork Wailua River for irrigation of sugarcane in vicinity of Lihue.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.19		*0	0.34	0.26	0.07	0	0	0	*7.07	0.12	0.07
2	.19		0	.26	.26	.07	0	*0	*2.43	4.69	.66	0
3	.19	(*)	0	.26	.26	.07	0	0	9.62	.43	.32	0
4	.12		0	.19	.26	.07	0	0	8.18	.43	.12	0
5	.12		0	.26	.26	.07	*1.12	.32	8.18	.43	.19	0
6	.19		0	.26	.26	.07	0	0	7.70	.43	.12	0
7	.19		0	.26	.26	.07	0	0	7.07	.34	.12	0
8	.19		13.2	.19	.26	.07	0	0	7.07	.19	.07	0
9	.19		24.4	.19	.26	.07	.05	0	6.86	.19	.07	.02
10	.33		13.9	.19	.26	.07	.06	0	10.4	.19	.02	.02
11	0		15.6	.19	.26	.07	0	0	10.6	.37	0	.02
12	0		16.5	.19	.26	.07	0	0	15.0	.07	.01	0
13	0		15.6	.19	.26	.07	0	0	16.2	.37	7.75	0
14	0		16.8	11.1	.19	.59	0	0	15.9	.07	10.0	0
15	.12		16.2	20.7	.19	.07	0	0	15.9	.07	.73	0
16	.06		10.2	16.2	.19	2.68	0	0	16.8	.07	.62	0
17	0		.43	15.3	.19	.02	0	0	17.9	.12	.73	0
18	0		.43	18.7	.12	.19	0	0	19.7	.01	.73	0
19	0		.43	5.91	.12	.50	0	0	20.7	0	.62	0
20	0		.34	.52	.12	.02	0	0	19.4	0	.62	0
21	0		.26	.52	.12	0	0	0	18.7	0	.62	10.9
22	0		14.6	.43	.12	0	0	0	18.7	0	.62	18.1
23	0		20.7	.43	.07	0	0	0	21.0	0	.62	17.5
24	0		7.08	.34	.07	0	.51	0	20.4	0	.62	17.2
25	.11		.52	.26	.12	0	0	0	20.0	0	.62	15.6
26	.07		.52	.19	.12	0	0	0	19.0	0	.62	14.7
27	.02		.52	.19	.12	0	0	0	17.8	.04	.73	16.2
28	0		.52	.19	.12	0	0	0	17.5	.07	.34	25.1
29	0		.43	.19	.07	0	0	---------	18.4	.12	.19	6.50
30	0		.43	.26	.07	0	0	---------	29.0	.12	.19	.52
31	0		----------	.26	----------	0	0	---------	19.5	----------	.12	----------
Total	2.28	0	189.61	94.66	5.50	4.98	1.74	0.32	455.61	15.89	28.91	142.45
Mean												
Mgd	0.074	0	6.32	3.05	0.183	0.161	0.056	0.011	14.7	0.530	0.933	4.75
Cfs	0.114	0	9.78	4.72	0.283	0.249	0.087	0.017	22.7	0.820	1.44	7.35
Ac-ft	7.0	0	582	290	17	15	5.3	1.0	1400	49	89	437

Calendar Year 1964:	Max	30.0	Min	0	Mean mgd	3.20	Mean cfs	4.95	Ac-ft	3600		
Fiscal Year 1964-65:	Max	29.0	Min	0	Mean mgd	2.58	Mean cfs	3.99	Ac-ft	2890		

* Discharge measurement or observation of no flow made on this day.

630. North Fork Wailua River at altitude 650 ft, near Lihue

Location.--Lat 22°04'02", long 159°26'21", on right bank 0.5 mile downstream from intake of Stable storm ditch and 7.8 miles northwest of Lihue.

Drainage area.--6.6 sq mi, approximately.

Records available.--September 1914 to March 1915, May 1915 to October 1918, December 1918, March 1919, June 1919 to June 1965. Monthly discharge only for some periods, published in WSP 1319.

Gage.--Water-stage recorder. Altitude of gage is 650 ft (from topographic map). Prior to Sept. 9, 1944, at datum 2.0 ft higher.

Average discharge.--49 years (1915-18, 1919-65), 47.0 mgd (72.7 cfs).

Extremes.--Maximum discharge during year, 4,390 mgd (6,790 cfs) Dec. 16 (gage height, 10.14 ft), from rating curve extended above 1,500 mgd; minimum, 1.68 mgd (2.60 cfs) Mar. 22, 23, 26, 27.
1914-65: Maximum discharge, 8,550 mgd (13,200 cfs) Nov. 12, 1955 (gage height, 13.53 ft), from rating curve extended above 470 mgd on basis of slope-area measurement at gage height 10.65 ft; minimum, 0.22 mgd (0.34 cfs) Oct. 27, 1953.

Remarks.--Records fair. Since 1925 Hanalei tunnel (see p. 49) has diverted from Hanalei River basin into North Fork Wailua River above station; North Wailua and Stable storm ditches (see preceding pages) divert water above station for power development and irrigation in vicinity of Lihue.

Rating tables (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used May 10 to June 14)

July 1-25		July 25 to June 30			
2.7	24.0	1.8	1.25	3.0	48.0
3.0	41.0	1.9	2.10	3.5	108
3.5	86.0	2.1	4.60	4.0	205
4.0	158	2.3	9.10	4.5	340
4.5	260	2.5	15.7	5.0	510
5.0	400	2.7	25.5		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	*29.6	41.2	*26.8	*79.8	231	52.2	32.0	12.8	12.1	*27.4	45.4	43.2
2	30.8	69.3	25.5	36.5	348	*51.2	37.0	*13.2	23.7	31.0	422	*33.5
3	29.0	*33.5	35.0	40.8	*178	39.5	55.4	27.2	*17.4	34.8	*338	32.0
4	30.8	30.0	26.8	28.8	201	35.0	34.2	63.2	7.10	24.4	220	31.4
5	28.0	33.5	43.7	80.5	212	32.0	*176	241	7.60	141	244	32.0
6	49.0	35.0	33.5	94.0	119	30.7	192	63.4	6.20	157	105	25.0
7	45.3	28.8	23.8	188	169	30.0	56.0	73.0	6.20	118	72.6	22.2
8	54.9	78.3	858	70.2	131	30.7	83.3	35.8	6.20	45.4	99.8	20.6
9	46.6	43.8	20.3	52.0	94.0	43.6	99.6	42.4	6.40	98.8	54.0	19.6
10	33.7	43.8	18.4	44.6	73.8	97.3	212	26.8	9.52	435	38.8	19.1
11	27.5	30.7	12.8	36.5	66.7	202	51.0	22.8	8.44	302	48.6	18.3
12	63.5	47.0	14.3	32.0	129	137	73.0	21.1	8.35	109	28.1	27.1
13	33.8	38.0	12.8	29.4	132	148	103	19.1	6.40	348	53.2	31.6
14	32.0	38.0	15.7	18.6	71.4	377	45.4	18.7	6.40	69.0	220	92.4
15	47.7	40.4	14.3	38.0	87.0	151	40.4	17.0	6.20	42.0	61.1	80.0
16	61.2	59.3	107	14.3	85.3	316	38.0	15.3	5.60	34.2	43.6	60.7
17	37.4	110	39.5	12.5	66.8	77.4	38.8	14.3	4.06	28.8	43.8	43.3
18	52.4	42.9	65.3	28.8	64.6	382	32.8	13.9	2.10	24.4	38.0	35.8
19	39.2	49.0	37.2	44.2	73.7	286	25.0	14.3	4.47	22.2	38.0	41.2
20	35.0	35.0	53.0	44.6	51.0	101	21.6	14.6	2.43	20.0	30.7	50.0
21	38.6	34.2	35.0	55.4	47.2	66.8	22.8	13.9	2.02	18.3	41.7	19.7
22	34.4	30.7	48.4	38.0	161	78.7	19.6	12.8	1.84	17.8	51.0	11.5
23	77.7	34.2	29.3	59.6	50.0	171	41.3	13.2	4.01	16.6	47.6	11.2
24	97.9	30.0	33.8	76.2	43.8	53.0	198	18.3	2.32	15.7	30.0	11.2
25	289	28.1	36.5	42.0	250	45.4	31.4	13.9	1.93	74.8	26.8	10.6
26	116	25.0	28.8	41.2	129	39.5	21.6	12.5	1.68	96.5	55.1	10.6
27	65.7	23.8	25.5	41.2	67.9	50.7	23.8	12.1	2.21	108	30.0	10.6
28	54.0	23.3	25.5	47.2	56.0	41.2	21.6	12.1	4.18	123	39.9	36.1
29	41.2	25.0	27.4	56.2	51.0	35.8	23.3	---------	4.80	135	48.2	19.6
30	38.0	22.8	73.2	149	43.8	52.2	14.6	---------	134	73.8	90.3	20.0
31	36.5	23.8	---------	344	---------	36.5	14.6	---------	194	---------	51.3	---------
Total	1,696.4	1,228.4	997.68	1,964.1	3,484.0	3,290.4	1,879.1	878.7	509.86	2,791.9	2,756.6	920.1
Mean												
Mgd	54.6	39.6	33.3	63.4	116	106	60.6	31.4	16.4	93.1	88.9	30.7
Cfs	84.5	61.3	51.5	98.1	179	164	93.8	48.6	25.4	144	138	47.5
Ac-ft	5,210	3,770	3,060	6,030	10,690	10,100	5,770	2,700	1,560	8,570	8,460	2,820

Calendar Year 1964:	Max	433	Min	2.57	Mean mgd	68.8	Mean cfs	106	Ac-ft	77,330
Fiscal Year 1964-65:	Max	435	Min	1.68	Mean mgd	61.4	Mean cfs	95.0	Ac-ft	68,740

* Discharge measurement made on this day.

Peak discharge (base, 1,600 mgd, revised)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-25	1500	7.66	1,780	2,750	1-24	0300	7.21	1,730	2,680
12-14	0500	8.84	3,140	4,860	3-31	0230	9.94	4,190	6,480
12-16	1400	10.14	4,390	6,790	4-13	0400	8.72	3,030	4,690
1- 5	2300	7.97	2,350	3,640	5- 2	1600	8.23	2,590	4,010

680. East Branch of North Fork Wailua River near Lihue

Location.--Lat 22°04'19", long 159°25'05", on right bank 1,200 ft upstream from mouth and 7.5 miles northwest of Lihue.

Drainage area.--6.2 sq mi, approximately.

Records available.--July 1912 to September 1914, December 1914 to March 1915, May 1915 to March 1919, June 1919 to June 1965. Monthly discharge only for some periods, published in WSP 1319. See also Note below.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 500 ft (from topographic map). Prior to Dec. 31, 1914, staff gage at site 725 ft downstream at different datum. Dec. 31, 1914, to May 10, 1934, water-stage recorder at site 75 ft upstream at present datum.

Average discharge.--50 years (1913-14, 1915-18, 1919-65), 31.1 mgd (48.1 cfs).

Extremes.--Maximum discharge during year, 3,930 mgd (6,080 cfs) Mar. 31 (gage height, 9.13 ft), from rating curve extended above 1,700 mgd; minimum, 12.0 mgd (18.6 cfs) Sept. 8, Mar. 26-29.
1912-65: Maximum gage height, 14.7 ft, from floodmarks, Nov. 12, 1955 (discharge not determined); minimum discharge, 4.4 mgd (6.8 cfs) July 3, 13, 1926.

Remarks.--Records fair. No diversion above station. Continuous records of rainfall are obtained at station.

Note.--Published records for the fiscal year 1918 have been found to be in error; revised records are on file in the district office and will be published in the next water-supply paper.

Rating tables (gage height, in feet, and discharge, in million gallons a day)

July 1 to Mar. 31				Apr. 1 to June 30			
1.4	12.0	2.5	130	1.5	12.0	2.5	110
1.7	30.5	3.0	232	1.7	23.6	3.0	200
2.0	60.0	4.0	520	2.0	48.5	4.0	445

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	19.9	21.7	16.4	27.7	130	29.1	22.3	*17.0	*14.8	59.0	46.6	*35.7
2	20.5	32.5	14.8	17.5	*148	27.0	21.1	16.4	45.8	44.3	239	30.8
3	20.5	19.3	17.5	18.1	127	24.9	27.0	31.4	37.5	47.2	173	25.8
4	21.7	18.1	14.8	15.3	147	22.9	19.3	75.1	18.7	90.9	176	26.5
5	19.3	18.1	13.6	52.4	160	21.7	118	236	18.1	138	301	27.2
6	30.5	22.9	14.2	59.2	102	19.9	168	77.2	17.0	120	96.5	22.3
7	34.8	17.0	13.1	75.5	129	19.3	41.0	70.8	15.3	82.0	68.9	19.8
8	42.8	29.1	12.0	31.4	96.2	19.3	34.8	43.0	14.8	50.6	49.6	19.2
9	35.6	22.9	20.5	26.3	73.3	27.0	73.0	63.6	14.8	51.6	45.6	17.3
10	26.3	18.7	20.5	24.9	54.5	66.0	155	34.8	29.4	201	34.9	16.8
11	21.7	17.0	16.4	20.5	43.0	163	44.0	29.8	19.3	276	29.4	15.7
12	46.1	20.5	15.8	18.7	57.3	108	44.0	28.4	16.4	102	29.4	17.9
13	25.6	19.9	15.3	17.5	69.6	141	47.0	25.6	15.3	319	55.5	23.0
14	23.5	19.9	15.8	17.0	49.0	255	33.0	23.5	15.3	78.4	99.0	37.7
15	29.8	23.5	15.3	26.3	37.3	104	29.8	21.7	14.8	58.0	161	40.5
16	53.0	33.6	58.3	18.7	52.3	*219	27.0	21.1	14.2	46.6	52.7	30.1
17	29.1	30.5	23.5	18.7	48.0	73.3	24.9	19.3	13.6	39.0	42.8	20.4
18	31.4	20.5	32.0	40.1	39.0	175	22.9	18.7	13.6	33.3	39.0	18.6
19	25.6	25.6	20.5	31.4	53.8	233	21.1	18.1	14.2	30.8	43.9	23.6
20	22.3	19.9	23.5	26.3	35.6	68.4	20.5	18.1	13.1	30.1	41.9	27.9
21	25.6	18.7	18.1	28.4	29.8	52.3	20.5	18.1	13.1	28.6	39.6	19.2
22	24.9	17.5	34.4	23.5	35.6	43.0	18.7	17.0	12.6	26.5	74.9	17.9
23	76.7	19.3	30.5	34.9	26.3	50.1	18.1	16.4	14.8	25.0	79.5	16.8
24	44.0	18.1	24.2	50.9	24.2	33.9	47.5	22.3	13.6	23.0	37.4	17.3
25	131	18.7	19.9	27.7	105	29.8	24.2	18.1	12.6	86.3	30.8	16.2
26	55.6	16.4	17.5	27.0	108	27.7	19.3	16.4	12.0	91.1	44.7	15.7
27	34.8	15.8	16.4	25.6	44.0	27.7	24.2	15.3	12.0	96.5	29.4	16.8
28	29.1	15.3	15.8	29.8	34.8	26.3	22.9	14.8	12.0	95.0	42.8	40.8
29	26.3	14.8	15.8	38.7	32.2	23.5	40.0	---------	13.1	118	48.5	21.1
30	24.9	14.2	*19.3	113	*27.7	24.2	19.9	---------	77.6	*66.7	46.6	*16.8
31	*22.3	*15.3	---------	156	---------	*21.7	18.1	---------	*465	---------	38.2	---------
Total	1,075.2	635.3	605.7	1,139.0	2,119.5	2,177.0	1,267.1	1,028.0	1,034.4	2,554.5	2,338.1	695.4
Mean												
Mgd	34.7	20.5	20.2	36.7	70.6	70.2	40.9	36.7	33.4	85.2	75.4	23.2
Cfs	53.7	31.7	31.3	56.8	109	109	63.3	56.8	51.7	132	117	35.9
Ac-ft	3,300	1,950	1,860	3,500	6,500	6,680	3,890	3,150	3,170	7,840	7,180	2,130

Calendar Year 1964:	Max	388	Min	9.36	Mean mgd	41.4	Mean cfs	64.1	Ac-ft	46,490
Fiscal Year 1964-65:	Max	465	Min	12.0	Mean mgd	45.7	Mean cfs	70.7	Ac-ft	51,150

Peak discharge (base, 1,000 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
12-14	0530	7.18	2,230	3,450	4-11	0300	6.09	1,320	2,040
12-16	1400	6.57	1,790	2,770	4-13	0430	6.86	1,760	2,720
12-19	0100	5.32	1,060	1,640	5- 2	1800	6.38	1,470	2,270
1- 5	2300	5.88	1,370	2,120	5- 5	0200	5.95	1,260	1,950
3-31	0300	9.13	3,930	6,080	5-15	0330	6.43	1,500	2,320
4- 5	1830	6.24	1,400	2,170					

* Discharge measurement made on this day.

690. Wailua ditch near Kapaa

Location.--Lat 22°04'34", long 159°24'04", on right bank 2,000 ft downstream from Wailua Reservoir, 5.2 miles west of Kapaa, and 7 miles north of Lihue.

Records available.--November 1936 to June 1965.

Gage.--Water-stage recorder. Datum of gage is 462.3 ft above mean sea level (by stadia survey).

Average discharge.--28 years (1937-65), 9.89 mgd (15.3 cfs).

Extremes.--1936-65: Maximum daily discharge, 41 mgd (63 cfs) June 4, 1937; no flow at times.

Remarks.--Records good except those prior to Feb. 4, which are fair above 5 mgd and poor below. Ditch diverts water from North Fork Wailua River to reservoir 2,000 ft above station and thence to fields for irrigation of sugarcane near Kapaa.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	10.0	12.4	8.40	12.8	0.13	0.1	0.40	0.74	*8.34	3.24	0.88	*0.88
2	10.0	12.3	8.40	11.6	.11	.1	.40	*.69	8.61	.10	.78	.88
3	9.90	12.3	8.50	10.7	.11	.1	.40	.74	8.74	.08	.88	.88
4	9.90	12.2	8.60	10.8	.2	.1	.40	*.63	8.74	.06	.78	.88
5	9.90	12.3	10.3	10.8	.2	.1	.32	.68	8.74	.06	.98	.88
6	9.90	12.3	10.9	10.9	.1	.1	.40	.48	8.48	.06	.78	.88
7	10.0	11.3	9.40	10.5	.2	1.64	.48	.42	8.48	.06	.60	.88
8	10.9	10.1	10.9	9.90	.1	4.39	.48	.32	8.74	.06	.54	.88
9	12.2	10.1	13.5	9.80	.1	4.84	.53	.32	9.02	.06	.42	2.73
10	12.2	10.0	14.3	9.70	.1	2.55	.53	.32	9.02	.06	.42	5.56
11	12.2	6.02	14.4	9.60	.1	.2	.53	.32	5.87	.06	.48	5.79
12	12.3	6.28	14.5	11.0	.1	.2	.48	.42	4.11	.06	.54	5.79
13	12.3	7.90	14.4	14.8	.1	.2	.48	.42	4.01	.60	.54	5.79
14	11.1	8.50	14.3	18.1	.1	.2	.48	.54	4.01	1.08	.60	5.91
15	10.1	8.30	14.3	18.1	.1	.2	.48	.60	4.01	.98	.60	5.91
16	10.1	8.40	14.3	15.1	.1	.3	.48	.60	3.90	1.08	.68	6.03
17	10.2	8.30	14.4	12.8	.1	.58	.44	.54	3.90	1.08	.68	5.91
18	10.3	8.40	14.4	11.7	.1	.65	.48	.48	*3.90	.98	.68	8.30
19	10.3	10.0	14.5	5.00	.1	.57	.48	1.49	7.16	.98	.48	9.44
20	10.3	10.8	14.6	.29	.1	.53	*2.41	3.26	9.02	1.08	.68	9.30
21	10.4	9.10	14.6	.23	.1	.48	4.57	3.04	8.88	1.08	.60	9.30
22	10.4	8.40	*14.6	.20	.2	.44	2.34	2.62	8.88	1.08	.68	11.4
23	10.5	8.30	14.6	.23	.1	.40	1.15	2.84	8.74	1.08	.68	13.8
24	10.5	8.40	13.4	.23	.1	.36	1.10	2.94	8.88	1.08	.78	18.8
25	10.5	8.30	12.6	.23	.2	.32	.98	*3.24	6.58	1.18	.68	20.4
26	10.5	8.40	12.6	*.20	.2	.32	.93	5.95	5.56	1.18	.68	20.4
27	10.4	8.30	12.6	.18	.1	.29	1.04	7.54	5.56	1.08	.68	20.2
28	10.5	8.40	12.6	.15	.1	.32	.93	8.07	5.67	.98	.78	15.8
29	11.4	8.40	12.6	.18	.1	.32	.88	---------	5.79	*.88	.88	9.15
30	12.4	8.40	*12.6	.15	.1	.36	.78	---------	8.22	.88	.88	*6.68
31	*12.4	*8.40	---------	.13	---------	.40	.78	---------	*7.12	---------	.88	---------
Total	334.00	291.00	380.10	226.10	3.65	21.66	26.56	50.25	216.68	22.32	21.22	229.43
Mean												
Mgd	10.8	9.39	12.7	7.29	0.122	0.699	0.857	1.79	6.99	0.744	0.685	7.65
Cfs	16.7	14.5	19.6	11.3	0.189	1.08	1.33	2.77	10.8	1.15	1.06	11.8
Ac-ft	1020	893	1170	694	11	66	82	154	665	68	65	704

Calendar Year 1964:	Max	18.1	Min	0	Mean mgd	5.55	Mean cfs	8.59	Ac-ft	6230		
Fiscal Year 1964-65:	Max	20.4	Min	0.1	Mean mgd	4.99	Mean cfs	7.72	Ac-ft	5590		

* Discharge measurement made on this day.

Note.--No gage-height record Nov. 4 to Dec. 6, Dec. 11-16

710. North Fork Wailua River near Kapaa

Location.--Lat 22°03'08", long 159°22'22", on right bank 1.1 miles upstream from confluence with South Fork, 3.5 miles southwest of Kapaa, and 5.0 miles north of Lihue.

Drainage area.--18.7 sq mi.

Records available.--July 1952 to June 1965.

Gage.--Water-stage recorder. Altitude of gage is 18 ft (from topographic map).

Average discharge.--13 years, 82.1 mgd (127 cfs).

Extremes.--Maximum discharge during year, 5,030 mgd (7,780 cfs) Dec. 16 (gage height, 9.02 ft), from rating curve extended above 2,400 mgd as explained below; minimum, 7.60 mgd (11.8 cfs) Mar. 25, 26.
1952-65: Maximum discharge, 34,400 mgd (53,200 cfs) Nov. 12, 1955 (gage height, 19.88 ft in gage well, 20.8 ft from floodmarks), from rating curve extended above 2,400 mgd on basis of slope-area measurement of peak flow; minimum, 1.37 mgd (2.12 cfs) Oct. 28, 1953.

Remarks.--Records fair. Wailua ditch (see preceding page) and Aahoaka ditch divert above station for irrigation of sugarcane in the vicinity of Kapaa and Wailua, respectively.

Rating table (gage height, in feet, and discharge, in million gallons a day)

1.3	7.60	3.0	195
1.4	10.8	3.5	328
1.7	24.6	4.0	500
2.1	55.0	5.0	1,000
2.5	103		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	47.8	63.0	49.6	112	428	110	112	42.8	13.9	132	115	99.8
2	49.6	110	40.4	56.0	556	103	109	40.4	56.8	88.1	687	91.8
3	48.7	57.0	59.5	61.1	398	96.0	138	61.4	54.0	107	562	85.1
4	56.0	*50.5	50.5	45.2	408	79.9	96.0	154	24.1	144	480	85.1
5	53.2	48.7	57.9	125	440	73.8	236	640	21.9	272	811	85.1
6	79.9	65.0	58	168	313	70.5	567	215	23.5	282	292	73.8
7	83.8	49.6	42.8	290	368	67.2	126	204	22.4	243	*187	66.1
8	116	106	29.8	114	304	59.0	90.7	112	17.0	112	173	54.1
9	90.1	89.6	26.0	91.8	*227	*68.8	173	130	9.52	129	137	44.4
10	66.1	72.4	30.0	76.0	167	172	508	82.5	29.5	589	100	42.0
11	47.8	53.2	20.8	62.0	138	396	149	63.0	21.9	580	89.5	42.0
12	110	68.8	19.8	56.0	234	314	158	59.0	28.4	194	79.9	57.8
13	69.8	64.0	23.0	43.6	259	336	210	57.0	29.7	812	120	69.0
14	60.0	66.1	33.1	30.4	159	671	a110	52.3	27.2	192	374	114
15	95.2	76.0	25.2	50.5	158	368	a 95	53.2	26.5	120	266	139
16	129	121	139	29.7	174	686	a 85	58.0	23.0	106	135	*92.4
17	76.0	167	143	21.9	145	234	a 90	76.0	19.2	94.6	130	65.0
18	102	82.5	98.1	57.0	126	618	a 70	82.5	*14.7	86.4	114	65.0
19	74.9	93.1	60.0	85.2	156	703	a 55	73.8	15.2	71.6	119	58.0
20	64.0	71.6	70.1	98.8	109	239	*a 48	58.0	18.8	61.0	124	72.7
21	65.0	70.5	53.2	101	98.8	185	51.4	57.0	15.6	55.0	113	44.4
22	70.5	65.0	*86.5	78.6	224	160	46.9	42.0	14.7	61.0	147	24.6
23	170	71.6	66.5	107	100	276	63.2	32.4	15.2	63.0	147	20.3
24	117	63.0	68.9	134	86.4	141	273	40.3	10.2	49.6	97.4	18.8
25	473	58.0	64.0	82.5	413	130	70.5	35.2	7.60	151	83.8	13.9
26	218	50.5	56.0	78.6	333	123	40.4	23.5	7.92	204	124	9.84
27	118	48.7	49.6	77.3	161	130	33.1	17.4	8.56	231	85.1	9.52
28	94.6	46.0	44.4	94.6	125	121	48.7	15.2	8.88	264	101	46.0
29	74.9	46.0	37.3	117	115	110	67.7	---------	8.56	290	123	38.8
30	68.3	45.2	73.5	296	104	125	46.0	---------	48.8	171	153	40.4
31	63.0	46.0	----------	609	----------	116	46.0	---------	875	----------	124	----------
Total	3.052.2	2.185.6	1.676.5	3.449.8	7.027.2	7.082.2	4.012.6	2.577.9	1.518.24	5.955.3	6.393.7	1.768.76
Mean												
Mgd	98.5	70.5	55.9	111	234	228	129	92.1	49.0	199	206	59.0
Cfs	152	109	86.5	172	362	353	200	142	75.8	308	319	91.3
Ac-ft	9.370	6.710	5.140	10.590	21.570	21.730	12.310	7.910	4.660	18.280	19.620	5.430

Calendar Year 1964:	Max	1.050	Min	4.37	Mean mgd	132	Mean cfs	204	Ac-ft	147.800
Fiscal Year 1964-65:	Max	875	Min	7.60	Mean mgd	128	Mean cfs	198	Ac-ft	143.300

* Discharge measurement made on this day.
a No gage-height record.

Peak discharge (base, 2,300 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
12-14	0600	8.28	4,060	6,280	3-31	0730	8.67	4,570	7,070
12-16	1400	9.02	5,030	7,780	4- 5	2000	6.75	2,450	3,790
12-19	0200	7.24	2,940	4,550	4-13	0530	8.36	4,170	6,450
1- 5	2330	7.50	3,200	4,950	5- 2	1730	8.14	3,880	6,000
2- 5	0230	6.66	2,360	3,650	5- 5	0200	6.80	2,500	3,870

715. Left Branch Opaekaa Stream near Kapaa

Location.--Lat 22°04'43", long 159°23'55", on left bank 0.4 mile upstream from mouth, 0.6 mile northeast of Wailua Reservoir, and 4.9 miles west of Kapaa.

Drainage area.--0.7 sq mi, approximately.

Records available.--May 1960 to June 1965. Prior to July 1963, published as Left Branch Opaikaa Stream near Kapaa.

Gage.--Water-stage recorder and concrete control. Datum of gage is 458.4 ft above mean sea level (by stadia survey).

Average discharge.--5 years, 2.13 mgd (3.30 cfs).

Extremes.--Maximum discharge during year, 148 mgd (229 cfs) Apr. 11 (gage height, 4.76 ft), from rating curve extended above 20 mgd; minimum, 0.60 mgd (0.93 cfs) Mar. 22-30.
1960-65: Maximum discharge, 236 mgd (365 cfs) Apr. 15, 1963 (gage height, 5.21 ft), from rating curve extended above 7.9 mgd; minimum, 0.20 mgd (0.31 cfs) Jan. 14, 15, 1963.

Remarks.--Records fair except those for period of no gage-height record, which are poor. No diversion above station. Continuous records of rainfall are obtained at station.

Rating table (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used Sept. 17-26, Oct. 26 to Nov. 25)

0.8	0.26	1.5	5.80
.9	.68	2.0	13.4
1.0	1.21	2.5	25.0
1.2	2.62		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.21	1.40	1.00	1.27	4.50	2.99	2.39	1.47	1.10	2.89	a6.0	2.62
2	1.21	1.59	1.00	1.21	4.18	2.81	2.31	1.47	1.21	1.66	a20	2.54
3	1.16	1.34	1.05	1.16	6.06	2.54	2.24	1.59	1.27	1.72	a15	2.47
4	1.16	1.27	1.05	1.10	7.97	2.39	2.08	2.00	1.05	7.57	a18	2.39
5	1.16	1.27	1.05	1.53	7.80	2.24	3.46	11.9	1.00	6.76	*a22	2.39
6	1.21	1.34	1.05	1.85	6.45	2.16	9.12	3.36	.94	5.56	12.1	2.31
7	1.21	1.21	1.05	3.18	7.41	2.08	2.71	2.90	.89	3.76	8.95	2.16
8	1.34	1.47	1.10	1.72	5.80	2.00	2.47	2.47	.89	2.71	6.84	2.08
9	1.27	1.40	1.21	1.34	4.72	*2.24	3.49	2.24	.84	2.39	5.56	2.00
10	1.16	1.21	1.27	1.34	4.08	4.16	12.9	2.16	1.00	2.90	4.72	1.93
11	1.10	1.16	1.34	1.16	3.46	6.20	3.76	2.08	1.05	14.3	4.28	1.85
12	1.34	1.16	1.34	1.05	3.36	5.56	3.86	2.00	.94	6.45	3.97	1.93
13	1.16	1.21	1.34	1.00	3.55	9.59	3.86	1.85	.84	23.1	4.08	1.93
14	1.10	1.21	1.40	.94	2.99	12.9	3.08	1.79	.84	7.52	5.80	2.00
15	1.34	1.21	1.47	1.27	2.81	14.1	2.90	1.72	.79	5.20	4.28	2.00
16	1.66	2.28	1.85	1.05	2.81	20.8	2.62	1.66	.79	4.18	3.86	*1.85
17	1.66	1.40	1.59	1.00	2.71	9.55	2.47	1.59	.73	3.66	3.66	1.72
18	1.59	1.27	1.85	1.47	2.39	11.8	2.39	1.53	*.73	3.18	3.46	1.66
19	1.40	1.59	1.66	1.27	2.99	21.7	2.24	1.53	.68	2.90	3.36	1.72
20	1.34	1.27	1.72	1.05	2.47	8.50	*2.24	1.47	.64	2.62	3.36	1.66
21	1.27	1.27	1.66	1.00	2.31	6.58	2.08	1.40	.64	2.47	3.08	1.59
22	1.27	1.16	*2.08	.94	2.62	5.56	2.00	1.34	.60	a2.3	4.02	1.59
23	1.66	1.21	2.00	1.05	2.08	4.84	1.93	1.34	.64	a2.1	3.46	1.53
24	1.59	1.16	1.66	1.27	2.00	4.50	2.00	1.34	.64	a2.0	2.99	1.53
25	2.47	1.16	1.59	1.05	7.93	3.76	1.93	1.27	.60	a5.0	2.81	1.47
26	2.16	1.16	1.47	*.94	8.27	3.36	1.72	1.16	.60	a7.0	2.90	1.47
27	1.72	1.10	1.34	1.00	4.08	3.18	1.72	1.10	.60	a8.5	2.71	1.40
28	1.59	1.05	1.34	1.10	3.46	2.90	2.08	1.10	.60	a8.0	2.71	1.53
29	1.53	1.00	1.27	1.40	3.66	2.81	2.08	---------	.60	*a9.0	2.81	1.40
30	1.47	1.00	1.27	2.78	3.08	2.62	1.66	---------	.64	a7.0	3.18	1.34
31	*1.40	*1.00	---------	8.85	---------	2.47	1.59	---------	9.42	---------	2.99	---------
Total	43.91	39.53	42.07	48.34	128.00	188.89	93.38	58.83	33.80	164.40	192.94	56.06
Mean												
Mgd	1.42	1.28	1.40	1.56	4.27	6.09	3.01	2.10	1.09	5.48	6.22	1.87
Cfs	2.20	1.98	2.17	2.41	6.61	9.42	4.66	3.25	1.69	8.48	9.62	2.89
Ac-ft	135	121	129	148	393	580	287	181	104	505	592	172

Calendar Year 1964:	Max	29.1	Min	0.33	Mean mgd	2.69	Mean cfs	4.16	Ac-ft	3020
Fiscal Year 1964-65:	Max	23.1	Min	0.60	Mean mgd	2.99	Mean cfs	4.63	Ac-ft	3350

* Discharge measurement made on this day.
a No gage-height record.

Peak discharge (base, 90 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
12-16	1500	4.62	137	212	4-13	0530	4.41	120	186
12-19	0100	4.22	106	164	probably	-	4.20	105	162
4-11	0400	4.76	148	229	5- 5				

770. Makaleha ditch near Kealia

Location.--Lat 22°07'00", long 159°22'04", on left bank at end of last tunnel from which flow enters Mimino Reservoir, 3.9 miles northwest of Kealia, and 4.1 miles northwest of Kapaa.

Records available.--December 1936 to June 1965.

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 518 ft above mean sea level (by stadia survey).

Average discharge.--28 years (1937-65), 4.42 mgd (6.84 cfs).

Extremes.--1936-65: Maximum daily discharge, 20.2 mgd (31.3 cfs) Aug. 1, 1961; no flow at times.

Remarks.--Records good. Ditch diverts from Makaleha Stream for irrigation of sugarcane near Kealia.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	8.60	8.00	7.59	8.90	1.66	0.28	6.54	0.12	6.00	4.00	0.49	*0.20
2	8.60	3.78	6.18	6.72	1.29	.22	3.62	.10	*10.6	2.52	2.49	.20
3	5.45	*4.38	8.64	8.30	*1.50	*.17	.28	.10	10.6	2.45	2.04	.17
4	1.20	6.54	6.72	2.80	1.15	.14	*2.39	.13	8.00	3.30	3.12	.14
5	1.20	7.90	7.48	4.47	1.06	.12	6.63	2.67	2.90	1.95	8.46	.14
6	8.98	9.00	6.72	7.08	.88	.12	4.31	1.29	.42	1.20	2.22	.12
7	13.6	6.81	5.84	7.26	.72	.08	.72	1.20	.36	.97	1.10	.12
8	12.9	9.60	5.52	6.81	.64	.06	.42	.79	4.62	.68	.60	.10
9	13.1	4.27	9.43	6.54	.60	.05	.65	.49	7.08	.49	.36	.10
10	10.9	5.56	9.10	6.63	.28	.31	4.51	.36	12.1	.25	.60	.10
11	8.00	6.72	8.30	2.89	.20	1.50	1.15	.31	11.3	.20	2.04	.08
12	6.02	9.30	8.60	3.50	.39	1.87	.72	.22	7.35	1.76	1.52	.08
13	5.16	8.90	2.88	5.84	.36	1.82	.57	.17	.46	7.26	.12	.08
14	9.91	8.00	5.11	5.68	.34	2.27	.36	.14	.42	1.55	.42	1.34
15	10.6	8.80	7.80	9.05	.34	7.90	.31	.12	4.60	.72	1.25	2.58
16	11.8	3.20	10.4	6.99	.57	5.07	.20	.08	7.35	.42	.72	2.58
17	10.9	5.81	9.10	7.44	1.02	2.52	.17	.06	7.08	.28	.39	3.16
18	10.7	7.26	9.70	5.50	.75	1.70	.12	.05	6.90	.20	.31	3.44
19	3.67	9.20	8.10	.46	.92	4.67	.10	.03	7.08	.14	.39	4.18
20	5.55	8.00	3.68	.46	.60	1.40	.08	.03	6.63	.22	.39	4.80
21	10.1	7.08	3.96	.39	.39	.72	.08	.03	6.18	.12	.31	4.10
22	9.60	6.63	9.74	.34	.28	.39	.06	1.88	6.27	.10	.73	5.88
23	10.8	2.96	10.0	.31	.17	.31	.05	3.44	7.95	.08	.42	6.90
24	11.7	4.94	8.20	.36	.17	.20	.22	3.51	7.26	.06	.31	6.99
25	6.86	7.71	7.17	.34	1.05	.12	.17	3.58	6.90	.46	.22	6.72
26	1.20	6.54	6.54	.31	1.99	.10	.08	4.24	6.72	1.10	.34	6.90
27	5.83	6.45	6.00	.28	1.15	.08	.08	5.68	6.54	1.24	.20	7.62
28	7.90	5.84	5.84	.28	.64	.08	.10	5.60	6.72	2.04	.20	8.40
29	7.35	5.68	5.84	.50	.42	2.32	.31	---------	7.53	1.66	.22	8.20
30	7.90	2.45	*8.50	1.06	.31	6.27	.17	---------	8.40	*.92	.20	*7.44
31	7.17	*4.23	----------	1.87	----------	6.54	.14	---------	*5.51	----------	.20	----------
Total	253.25	201.54	218.68	119.36	21.84	49.40	35.31	36.42	197.83	38.34	32.38	92.86
Mean												
Mgd	8.17	6.50	7.29	3.85	0.728	1.59	1.14	1.30	6.38	1.28	1.04	3.10
Cfs	12.6	10.1	11.3	5.96	1.13	2.46	1.76	2.01	9.87	1.98	1.61	4.80
Ac-ft	777	618	671	366	67	152	108	112	607	118	99	285

Calendar Year 1964:	Max	13.6	Min	0.02	Mean mgd	4.04	Mean cfs	6.25	Ac-ft	4540
Fiscal Year 1964-65:	Max	13.6	Min	0.03	Mean mgd	3.55	Mean cfs	5.49	Ac-ft	3980

* Discharge measurement made on this day.

790. Kapahi ditch near Kealia

Location.--Lat 22°06'09", long 159°22'28", on right bank 500 ft downstream from intake and 4.0 miles west of Kealia.

Records available.--April 1909 to February 1911, May 1911, July 1911 to May 1914, July 1915 to April 1917, June 1917 to June 1965. Published as "at Kapahi, near Kapaa" prior to January 1913 and as "at Kapahi, near Kealia" January to December 1913.

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 377.1 ft above mean sea level (by stadia survey). Prior to Nov. 26, 1936, at site 61 ft upstream at datum 2.52 ft higher.

Average discharge.--47 years (1917-20, 1921-65), 4.53 mgd (7.01 cfs).

Extremes.--1909-65: Maximum daily discharge, 89.2 mgd (138 cfs) Feb. 6, 1913; no flow at times.

Remarks.--Records good. Ditch diverts from Kapaa Stream for irrigation in vicinity of Kapaa.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.10	4.62	0.27	0.16	0.40	0.86	0.07	0.19	2.13	*0.72	0.16	0.14
2	3.58	8.18	.23	.16	*.35	2.18	.07	.16	*9.02	.27	.76	.19
3	5.66	*4.36	.23	.16	.31	4.16	.07	.19	4.17	.29	.16	.19
4	5.92	4.04	.47	.16	.27	4.16	.07	.32	1.30	.24	.93	.19
5	5.79	4.39	.50	3.44	.27	4.16	.52	.77	.86	.33	.85	.19
6	2.64	5.40	.40	5.40	.16	4.04	.39	.33	.68	.27	.13	.19
7	.13	4.04	.35	4.75	.19	2.43	.07	.35	.62	.19	.10	.19
8	.10	6.06	.31	4.62	.19	.27	.07	.23	.64	.16	.10	.16
9	.13	7.16	.31	3.15	.19	.23	.28	.19	.27	.16	.07	.16
10	.13	2.61	1.92	.23	.19	.31	.86	.16	.32	.19	.07	.16
11	.10	.23	3.82	.19	1.97	.90	.07	.16	.23	.19	.07	.16
12	.20	.23	3.36	2.37	4.62	.45	.13	.13	.51	.39	.07	.19
13	.13	.23	4.50	3.14	1.84	.50	.13	.13	.35	1.39	.10	.16
14	.13	.23	4.75	3.03	.31	.52	.10	.13	.27	.28	.10	.16
15	.18	.23	4.39	2.79	.27	2.30	.10	.35	.23	.23	.13	.16
16	.23	.23	2.38	.40	.23	.94	.23	.45	.23	.24	.10	.13
17	.16	.23	4.39	.40	.23	5.00	.23	.27	.23	.19	.10	.35
18	.16	1.84	3.09	.45	2.72	3.02	.19	.23	.23	.16	.10	4.43
19	.13	7.90	.16	.27	2.79	.74	.16	.35	.23	.16	.13	8.81
20	.37	5.01	.16	.27	.31	.13	.16	.35	.19	.23	.10	7.30
21	2.88	3.82	.16	.27	.23	.10	.16	.31	.19	.27	.13	9.44
22	4.50	3.14	.16	.27	.23	.07	.13	.31	.16	.27	.53	7.34
23	4.75	3.14	.13	.27	2.94	.07	.13	.31	.16	.23	.10	5.01
24	1.92	2.49	.10	.27	4.85	.07	.41	.31	.50	.23	.19	5.14
25	.39	3.93	.10	.31	1.83	.10	.13	.45	.31	.24	.23	4.88
26	.13	3.70	.10	3.77	.10	.10	.10	.40	.23	.23	.16	4.88
27	.13	3.47	.10	9.44	.04	.10	.16	.31	.23	.40	.16	5.27
28	.13	3.14	.34	5.29	.02	.10	.16	.31	.31	.40	.13	3.15
29	2.25	3.03	.23	.31	.02	.07	.19	---------	.31	.31	.13	.23
30	5.14	4.50	.16	.69	.39	.07	.10	---------	.35	.19	.13	.19
31	4.62	*3.18	---------	.45	---------	.07	.13	---------	.78	---------	.16	---------
Total	52.81	104.76	37.57	56.88	28.46	38.22	5.77	8.15	26.24	9.05	6.38	69.14
Mean												
Mgd	1.70	3.38	1.25	1.83	0.949	1.23	0.186	0.291	0.846	0.302	0.206	2.30
Cfs	2.63	5.23	1.93	2.83	1.47	1.90	0.288	0.450	1.31	0.467	0.319	3.56
Ac-ft	162	321	115	175	87	117	18	25	81	28	20	212

Calendar Year 1964:	Max	11.1	Min	0.02	Mean mgd	1.84	Mean cfs	2.85	Ac-ft	2.060		
Fiscal Year 1964-65:	Max	9.44	Min	0.02	Mean mgd	1.21	Mean cfs	1.87	Ac-ft	1.360		

* Discharge measurement made on this day.

800. Kapaa Stream at Kapahi ditch intake, near Kapaa

Location.--Lat 22°06'15", long 159°22'29", on right bank at Kapahi ditch intake, 4 miles northwest of Kapaa, and 4.5 miles northwest of Wailua.

Drainage area.--3.3 sq mi, approximately.

Records available.--July 1936 to June 1965. Prior to July 1959, published as Kapaa River at Kapahi ditch intake, near Kapaa.

Gage.--Water-stage recorder and concrete-masonry control. Datum of gage is 381.8 ft above mean sea level (by stadia survey). Prior to July 1, 1962, at datum 0.07 ft higher.

Average discharge.--29 years, 13.5 mgd (20.9 cfs).

Extremes.--Maximum discharge during year, 2,420 mgd (3,740 cfs) Apr. 13 (gage height, 3.99 ft); no flow for several days.
1936-65: Maximum discharge, 4,960 mgd (7,670 cfs) Jan. 25, 1956 (gage height, 5.41 ft, present datum), from rating curve extended above 1,800 mgd by logarithmic plotting; no flow at times.

Remarks.--Records good. Entire low flow is diverted above station at times for irrigation of sugarcane. Records do not include flow of Kapahi ditch (see preceding page).

Rating table (gage height, in feet, and discharge, in million gallons a day)

0	0	0.7	35.2
.1	.28	.8	49.5
.2	1.41	1.1	105
.3	4.20	1.5	220
.4	8.90	2.0	445
.5	15.6		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	6.55	0	3.85	6.08	75.8	*16.5	7.02	11.6	2.04	52.0	22.7	21.8
2	3.94	6.00	3.20	3.50	78.2	14.3	8.43	*10.9	*13.9	20.0	111	18.3
3	3.50	*2.68	4.67	5.14	69.9	10.9	14.9	29.1	12.6	42.2	62.2	15.6
4	8.90	0	3.20	6.08	59.2	8.43	8.90	67.6	2.90	68.8	92.0	17.4
5	6.55	.18	3.20	38.3	58.5	7.96	50.3	134	10.2	66.9	220	18.3
6	16.7	2.45	2.90	38.5	38.1	7.49	72.9	47.3	12.2	54.2	36.6	14.9
7	16.2	0	2.60	41.4	42.4	8.43	16.5	45.2	9.57	32.0	28.8	14.3
8	17.4	13.2	2.60	5.61	29.8	10.9	14.9	23.6	5.62	19.2	21.8	13.6
9	10.9	5.27	6.55	2.90	27.7	20.9	48.2	27.1	4.31	21.8	23.7	12.9
10	7.02	6.08	2.73	7.49	19.2	61.9	118	17.4	29.8	53.8	17.4	12.2
11	4.67	3.85	0	7.96	14.3	154	17.4	14.3	10.9	104	14.3	12.2
12	35.5	6.08	0	3.08	20.9	78.8	20.0	13.6	7.80	46.3	18.5	12.9
13	12.0	4.67	3.51	0	24.5	86.8	21.8	12.9	11.6	262	31.7	18.3
14	7.02	4.67	1.76	0	19.3	101	14.3	12.2	12.2	26.6	49.5	26.6
15	11.5	5.61	0	4.71	33.9	108	12.2	12.2	6.98	20.0	121	20.0
16	30.1	12.9	26.0	3.20	39.5	173	12.2	12.2	3.85	18.3	25.6	13.6
17	8.90	10.9	1.76	5.14	36.5	26.6	11.6	11.6	3.85	16.5	20.0	9.57
18	8.90	2.78	6.79	38.8	24.4	67.2	10.9	11.6	3.50	14.9	21.2	4.68
19	10.5	2.13	4.20	34.1	45.0	132	10.9	11.6	3.50	14.3	25.7	2.68
20	6.85	0	10.2	22.7	20.0	23.6	10.9	12.2	3.50	14.3	21.8	7.49
21	5.39	.41	6.08	18.3	14.9	18.3	13.6	12.9	3.85	13.6	29.3	.66
22	2.62	.77	17.7	14.3	15.6	15.6	10.9	9.57	3.50	14.3	28.6	.30
23	35.4	8.21	7.96	24.8	8.90	17.4	10.9	7.96	4.20	14.3	20.9	.02
24	14.3	4.29	4.67	32.8	7.49	15.6	32.1	12.9	3.20	14.3	15.6	.01
25	98.2	.41	3.50	15.6	85.2	13.6	15.6	8.90	3.20	107	14.9	0
26	28.8	0	3.20	10.1	51.8	12.2	12.2	6.55	3.20	84.6	27.7	0
27	11.8	0	2.60	4.48	21.8	14.9	15.6	4.67	2.90	88.2	16.5	0
28	7.02	0	2.10	14.3	17.4	13.6	17.4	4.20	2.90	82.1	26.6	15.5
29	3.82	0	2.35	29.2	17.4	9.57	36.4	---------	3.20	63.4	29.8	6.08
30	0	2.83	*3.50	84.2	14.3	8.43	13.6	---------	8.62	33.1	29.8	*4.20
31	0	*2.35	---------	91.4	---------	7.02	12.9	---------	265	---------	22.7	---------
Total	440.95	108.72	143.38	614.17	1031.89	1264.93	693.45	605.85	474.59	1483.0	1247.9	314.09
Mean												
Mgd	14.2	3.51	4.78	19.8	34.4	40.8	22.4	21.6	15.3	49.4	40.3	10.5
Cfs	22.0	5.43	7.40	30.6	53.2	63.1	34.7	33.4	23.7	76.4	62.4	16.2
Ac-ft	1350	334	440	1880	3170	3880	2130	1860	1460	4550	3830	964

Calendar Year 1964:	Max	290	Min	0	Mean mgd	19.3	Mean cfs	29.9	Ac-ft	21610
Fiscal Year 1964-65:	Max	265	Min	0	Mean mgd	23.1	Mean cfs	35.7	Ac-ft	25850

* Discharge measurement or observation of no flow made on this day.

Peak discharge (base, 1,400 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
12-16	1330	3.43	1,670	2,580	4-13	0400	3.99	2,420	3,740
12-19	0100	3.28	1,490	2,310	5- 5	0100	3.51	1,760	2,720
3-31	0630	3.79	2,140	3,310					

870. Anahola ditch wasteway near Kealia

Location.--Lat 22°08'16", long 159°22'28", on right bank 300 ft downstream from wasteway gates on Anahola ditch, 500 ft north of Kaneha Reservoir, 3.8 miles west of Anahola, and 4.9 miles northwest of Kealia.

Records available.--July 1936 to June 1965.

Gage.--Water-stage recorder and sharp-crested weir. Datum of gage is 825 ft above mean sea level (by stadia survey).

Average discharge.--29 years, 3.33 mgd (5.15 cfs).

Extremes.--1936-65: Maximum daily discharge, 54 mgd (84 cfs) Nov. 12, 1955; no flow at times.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Water that passes station flows into Kaupaku Stream and thence into Anahola Stream 2 miles below the Anahola Stream gaging station.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.18	4.25	0.18	0.06	11	*6.72	3.85	*3.48	0.42	8.75	8.52	*7.80
2	.26	6.30	.12	.1	*16	6.30	3.65	3.16	.34	7.34	15.4	7.58
3	.18	2.04	.18	.3	13.0	5.25	5.45	6.30	.43	10.5	11.0	5.86
4	.18	.43	.18	0	11.9	3.65	3.48	8.52	.26	15.4	15.5	3.85
5	.18	.52	.2	1.6	11.6	3.16	4.90	13.6	.58	9.72	19.4	1.85
6	.26	.52	.2	2.0	11.9	2.82	12.0	10.8	4.21	9.72	10.8	1.58
7	.26	.52	.2	2.5	11.6	2.66	6.30	10.2	3.48	9.00	9.72	1.45
8	.18	.52	.2	.7	11.3	3.16	6.72	7.62	2.50	6.51	8.28	1.45
9	.18	.52	.1	.3	10.2	9.24	9.48	7.80	1.32	7.80	8.52	1.45
10	.26	.43	.1	.1	8.76	9.96	16.3	5.45	3.70	9.24	7.16	1.32
11	.26	.43	.1	.1	7.37	15.6	7.37	4.45	8.76	9.00	5.86	1.32
12	.26	.43	.1	0	8.52	14.7	5.86	4.25	5.65	9.48	7.16	1.32
13	.18	.43	.1	0	11.3	13.3	5.45	3.65	4.45	17.2	7.37	1.58
14	.26	.43	.1	0	7.80	14.9	4.25	3.32	4.05	6.30	10.5	1.71
15	.26	.43	.1	.7	8.76	23.8	3.65	3.16	1.32	5.65	24.0	1.85
16	.18	.34	.1	.1	12.2	18.4	3.48	2.66	.43	5.45	10.8	1.71
17	.18	.34	.1	0	12.2	11.6	3.32	2.50	.43	5.25	8.52	1.45
18	.26	.26	.1	3.5	11.0	11.6	2.99	2.50	.43	4.85	7.37	1.32
19	1.74	.26	.1	2.0	12.2	18.6	2.82	2.50	.43	4.25	6.08	1.58
20	2.73	.26	.1	.7	9.48	10.5	2.66	2.66	.43	4.83	5.65	1.58
21	.26	.26	.1	3.8	6.94	8.52	6.72	2.82	.43	3.65	7.50	1.45
22	.26	.18	.1	4.2	6.72	7.16	3.32	2.33	.43	3.48	10.9	1.71
23	4.45	.18	.1	5.9	5.05	7.80	2.66	2.16	.43	3.32	6.72	1.45
24	9.00	.18	.1	11	4.25	6.94	8.62	.84	.43	3.32	3.26	1.45
25	11.5	.18	.1	3.6	12.4	6.94	7.37	.18	.43	9.30	1.58	1.32
26	9.00	.18	.1	2.3	11.0	5.65	4.25	.18	.43	10.8	1.71	1.58
27	6.94	.18	.1	1.7	7.80	6.30	6.08	.18	.43	11.6	1.45	1.71
28	5.65	.12	.1	2.5	5.65	5.65	6.30	.26	.43	10.8	4.33	2.00
29	4.65	.18	.1	5.23	6.72	4.25	13.6	---------	.52	10.8	8.28	1.32
30	4.05	.18	.1	12.3	6.30	4.25	5.86	---------	.43	*9.72	7.80	1.32
31	*4.05	*.18	----------	11	----------	*4.22	4.45	---------	.43	----------	6.72	----------
Total	68.24	21.66	3.66	78.29	290.92	273.60	183.21	117.53	48.44	243.03	267.86	64.92
Mean												
Mgd	2.20	0.699	0.122	2.53	9.70	8.83	5.91	4.20	1.56	8.10	8.64	2.16
Cfs	3.40	1.08	0.189	3.91	15.0	13.7	9.14	6.50	2.41	12.5	13.4	3.34
Ac-ft	209	66	11	240	893	840	562	361	149	746	822	199

Calendar Year 1964:	Max	23.8	Min	0	Mean mgd	4.40	Mean cfs	6.81	Ac-ft	4,940		
Fiscal Year 1964-65:	Max	24.0	Min	0	Mean mgd	4.55	Mean cfs	7.04	Ac-ft	5,100		

* Discharge measurement made on this day.

Note.--No gage-height record Sept. 5-30, Oct. 2-28, Oct. 31 to Nov. 2.

880. Anahola ditch above Kaneha Reservoir, near Kealia

Location.--Lat 22°08'10", long 159°22'28", on left bank at point of discharge into Kaneha Reservoir, 500 ft below wasteway gates, and 5 miles northwest of Kealia.

Records available.--December 1921 to June 1965. Records for May 1915 to December 1921 at site 520 ft upstream not equivalent owing to diversion.

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 821.8 ft above mean sea level (Lihue Plantation bench mark). Dec. 9, 1921, to June 2, 1934, at site 480 ft upstream at different datum.

Average discharge.--41 years (1922-25, 1927-65), 2.95 mgd (4.56 cfs).

Extremes.--1921-65: Maximum daily discharge, 40 mgd (62 cfs) Nov. 12, 1947; no flow at times.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Ditch diverts water from Anahola Stream to Kaneha Reservoir, where it is stored for irrigation. Flow sometimes diverted above station by Anahola ditch wasteway (see preceding page).

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.55	a 0.02	3.33	*4.63	0.20	0.06	a 0.01	0.06	2.15	6.61	0.12	0.16
2	5.14	.06	2.09	2.27	.20	.04	a .01	.06	*8.32	.06	.27	.16
3	4.51	1.18	2.27	4.03	.24	a .02	.02	.06	8.18	.16	.12	.09
4	4.15	2.56	2.09	1.91	.20	a .02	a .01	.12	3.33	.48	.50	2.01
5	3.22	2.89	3.17	6.84	.16	a .02	.12	.16	5.23	.12	.27	4.27
6	6.92	4.39	2.00	8.90	.16	a .01	.16	.09	4.10	.12	.12	2.45
7	8.61	2.89	1.58	8.46	.16	a .01	.09	.06	.71	.09	.09	2.09
8	8.61	6.21	1.42	6.33	.12	a .01	.12	.45	.53	.06	.06	1.91
9	8.32	4.75	3.68	4.39	.12	.12	.20	.09	1.20	.06	.06	1.73
10	6.47	3.79	2.56	5.92	.06	.16	.32	a .01	5.71	.12	.04	1.64
11	4.75	2.56	2.67	3.33	a .02	.38	.12	a .01	.38	.12	.02	1.50
12	8.42	4.15	3.22	2.67	a .06	.28	.12	a .01	.28	.12	.06	1.73
13	5.66	4.39	2.45	2.36	.16	.28	.12	a .01	.20	1.19	.06	3.20
14	4.88	4.75	3.37	2.18	.04	.28	.12	a .01	.12	.09	.12	4.87
15	6.50	5.01	2.17	4.02	.09	.54	.12	a .01	1.56	.06	6.01	5.92
16	8.65	4.51	8.18	2.67	.20	.30	.12	a .01	2.27	.06	.04	4.51
17	6.33	6.33	4.38	3.22	.20	.16	.09	a .01	2.09	.04	.04	2.45
18	7.45	3.11	7.45	7.44	.16	.16	.09	a 0	2.09	a .02	.02	2.00
19	5.30	7.45	3.22	9.54	.16	.27	.09	a 0	2.09	a .01	.02	3.11
20	1.70	4.51	5.64	8.32	.16	.09	.09	a 0	1.82	.04	a .02	3.67
21	6.47	3.00	3.00	1.73	.12	.12	.12	a 0	1.64	a .02	.04	2.36
22	5.53	3.55	6.07	.09	.12	.16	.09	a 0	1.58	a .02	.16	3.67
23	4.93	6.42	4.75	.12	.06	.20	.09	a 0	2.18	a .01	.04	2.00
24	.09	4.63	2.78	.16	.04	.12	.27	2.71	1.73	a .01	1.81	2.09
25	.24	4.27	2.36	.09	.33	.12	.12	2.45	1.50	.18	3.33	1.58
26	.12	2.78	2.09	a .04	.16	.04	.09	1.82	1.42	.16	6.75	2.56
27	.09	2.36	1.91	a .04	.06	.06	.09	1.64	1.34	.20	3.55	3.22
28	.06	3.22	1.82	.09	.04	.04	.12	1.58	1.50	.20	3.46	5.92
29	.04	3.11	2.00	.20	.09	.02	.27	---------	3.48	.20	.12	2.18
30	a .02	3.00	2.78	.24	.04	.02	.12	---------	4.93	.12	.12	*1.58
31	.02	*2.78	---------	.24	---------	.02	.09	---------	*9.44	---------	.09	---------
Total	136.75	114.63	96.50	102.47	3.93	4.13	3.61	11.43	83.10	10.75	27.53	76.63
Mean												
Mgd	4.41	3.70	3.22	3.31	0.131	0.133	0.116	0.408	2.68	0.358	0.888	2.55
Cfs	6.82	5.72	4.98	5.12	0.203	0.206	0.179	0.631	4.15	0.554	1.37	3.95
Ac-ft	420	352	296	314	12	13	11	35	255	33	84	235

Calendar Year 1964:	Max	10.2	Min	0.01	Mean mgd	1.86	Mean cfs	2.88	Ac-ft	2090		
Fiscal Year 1964-65:	Max	9.54	Min	0	Mean mgd	1.84	Mean cfs	2.85	Ac-ft	2060		

* Discharge measurement made on this day.
a No gage-height record.

890. Anahola Stream near Kealia

Location.--Lat 22°09'05", long 159°21'17", on right bank at intake of Lower Anahola ditch and 4.5 miles northwest of Kealia.

Drainage area.--5.5 sq mi, approximately.

Records available.--August to December 1910, January 1913 to November 1918, January 1919, March 1919 to June 1965. Monthly discharge only for some periods, published in WSP 1319. Published as Anahola River above dam at Kiokala, near Kealia prior to July 1913 and as Anahola River near Kealia July 1913 to June 1958.

Gage.--Water-stage recorder and concrete dam-orifice control. Datum of gage is 295.11 ft above mean sea level (Highway Department bench mark). Prior to May 4, 1934, at site 0.1 mile upstream at different datum.

Average discharge.--51 years (1913-18, 1919-65), 14.3 mgd (22.1 cfs).

Extremes.--Maximum discharge during year, 5,810 mgd (8,990 cfs) May 15 (gage height, 10.6 ft), from rating curve extended above 42 mgd on basis of slope-area measurement of peak flow; minimum, 2.30 mgd (3.56 cfs) Oct. 4.
1910, 1913-65: Maximum discharge, 12,700 mgd (19,600 cfs) Jan. 25, 1956 (gage height, 14.6 ft, from floodmarks), from rating curve extended above 380 mgd; minimum, 1.27 mgd (1.96 cfs) Dec. 29, 30, 1963.

Remarks.--Records poor. Records include flow in Lower Anahola ditch (see following page). Anahola ditch (see preceding page) diverts 3 miles above station for irrigation in vicinity of Kealia.

Rating tables (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used May 20 to June 30)

July 1 to Dec. 16

1.3	2.05	1.9	27.0
1.4	3.28	2.2	64.0
1.5	5.30	2.5	120
1.6	8.10	3.0	260
1.7	12.7		

Dec. 16 to June 30

1.5	3.70	2.2	48.0
1.6	6.00	2.5	98.0
1.7	9.40	3.0	220
1.8	14.4	3.5	380
2.0	28.0	4.0	580

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	4.69	7.26	*4.22	*3.03	68.7	14.6	8.38	*9.90	6.00	83.8	28.0	15.2
2	*5.32	8.56	4.09	2.91	119	14.6	8.04	9.40	29.1	*87.6	187	*13.4
3	5.30	*6.42	4.09	4.09	*149	*12.7	9.06	10.4	*37.8	62.4	62.0	9.90
4	4.69	6.14	3.68	2.91	46.4	11.3	8.04	28.7	7.36	160	*84.2	9.06
5	4.49	5.86	3.16	37.2	50.0	10.4	*50.5	114	20.8	55.2	287	9.06
6	11.2	7.54	3.03	51.2	35.8	9.94	95.7	40.3	50.7	55.4	48.0	7.70
7	22.3	5.30	2.79	33.1	38.0	9.02	13.9	30.5	10.9	29.8	29.8	7.70
8	33.3	16.7	2.66	9.94	28.1	9.02	15.6	15.6	8.72	17.4	21.2	7.02
9	13.3	8.56	3.03	6.14	17.7	29.4	31.5	20.0	8.04	18.7	26.5	6.68
10	6.98	5.58	3.28	7.26	14.0	39.6	172	12.4	71.3	46.3	16.2	6.34
11	5.10	4.90	2.91	5.10	12.2	164	19.3	11.4	49.1	60.8	12.9	6.34
12	36.0	5.30	3.03	4.49	14.0	141	15.6	10.4	14.4	29.8	43.7	6.34
13	6.42	5.10	3.03	4.09	21.4	102	14.4	9.40	10.9	291	17.4	7.02
14	4.90	4.90	3.28	3.68	11.8	173	12.4	8.72	9.90	19.3	45.8	21.1
15	8.88	5.58	2.91	4.69	22.1	235	11.4	8.72	8.72	11.9	*525	17.2
16	37.7	6.42	22.9	4.21	54.7	188	10.9	8.38	8.38	9.90	79.0	8.72
17	7.74	8.10	7.26	5.30	57.3	43.6	9.90	8.04	7.70	9.06	42.5	6.34
18	13.1	4.90	23.2	80.4	26.2	35.1	9.40	7.70	10.7	8.38	31.6	5.77
19	8.56	7.82	5.86	30.3	44.2	147	9.06	7.70	10.4	8.04	29.8	6.34
20	6.14	6.14	10.6	22.6	17.7	28.9	8.72	7.36	8.38	15.0	27.1	7.02
21	6.98	4.69	4.69	11.8	14.0	22.0	17.40	7.02	7.70	8.04	57.3	5.77
22	7.26	4.49	10.2	9.02	13.3	18.1	8.72	6.68	7.02	17.8	61.8	6.34
23	84.1	12.8	5.86	18.6	11.3	14.4	8.04	6.34	7.36	25.8	22.8	5.54
24	22.8	5.30	4.09	25.9	9.94	15.0	68.5	7.02	6.68	25.8	16.8	5.31
25	87.4	4.90	3.48	9.02	78.2	12.9	15.6	6.34	6.34	123	15.6	4.85
26	55.5	4.29	3.03	6.70	49.6	11.9	9.40	6.00	6.00	140	41.4	4.85
27	15.2	4.09	2.79	6.42	23.0	11.4	10.9	5.77	5.77	134	11.9	5.31
28	11.3	3.89	2.66	9.48	16.5	9.90	13.4	5.54	6.34	62.0	15.6	14.1
29	9.94	3.68	2.79	26.2	25.9	9.40	119	---------	7.02	78.8	25.7	5.54
30	7.82	3.48	3.16	157	17.1	9.06	14.4	---------	7.36	40.3	19.1	4.62
31	7.54	4.29	---------	124	---------	8.72	11.9	---------	132	---------	13.9	---------
Total	561.95	192.98	161.76	726.78	1,107.14	1,560.96	831.06	429.73	588.89	1,735.32	1,946.6	246.48
Mean												
Mgd	18.1	6.23	5.39	23.4	36.9	50.4	26.8	15.3	19.0	57.8	62.8	8.22
Cfs	28.0	9.64	8.34	36.2	57.1	78.0	41.5	23.7	29.4	89.4	97.2	12.7
Ac-ft	1,720	592	496	2,230	3,400	4,790	2,550	1,320	1,810	5,330	5,970	756

Calendar Year 1964:	Max	279	Min	2.54	Mean mgd	22.1	Mean cfs	34.2	Ac-ft	24,870
Fiscal Year 1964-65:	Max	525	Min	2.66	Mean mgd	27.6	Mean cfs	42.7	Ac-ft	30,960

* Discharge measurement made on this day.

Peak discharge (base, 900 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-30	1900	4.58	939	1,450	4- 4	0400	5.76	1,520	2,350
12-14	0530	5.52	1,540	2,380	4-13	0430	8.25	3,400	5,260
12-16	1330	5.95	1,640	2,540	4-25	1300	5.33	1,260	1,950
1-10	0130	4.90	1,010	1,560	5- 2	1700	6.52	2,030	3,140
3-31	0600	4.93	1,020	1,580	5-15	1630	10.6	5,810	8,990

910. Lower Anahola ditch near Kealia

Location.--Lat 22°08'13", long 159°19'31", on left bank 100 ft downstream from last wasteway, 1.3 miles southwest of mouth of Anahola Stream, and 2.5 miles northwest of Kealia.

Records available.--December 1936 to June 1965.

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 276.11 ft above mean sea level (Highway Department bench mark).

Average discharge.--28 years (1937-65), 2.11 mgd (3.26 cfs).

Extremes.--1936-65: Maximum daily discharge, 12.0 mgd (18.6 cfs) June 1, 1938; no flow at times each year.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Ditch diverts from Anahola Stream for irrigation of sugarcane near Anahola.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	*3.75	0.03	2.66	0	0.01	*0	0	*0	0	0.07	0	*0
2	3.75	.03	2.79	0	.01	0	0	0	*0	.06	0	0
3	3.82	.03	2.92	0	**.01	0	0	0	0	.04	0	0
4	3.54	1.54	2.66	0	.03	0	0	0	0	.12	.13	0
5	3.98	3.61	2.53	0	.01	0	0	.04	0	.04	.10	0
6	2.42	3.75	2.40	0	.01	0	0	.04	0	.04	0	0
7	.06	3.68	2.16	0	.03	0	0	.04	0	.04	0	0
8	.04	2.17	2.72	0	.01	0	0	.04	.02	.04	0	0
9	.04	.04	2.34	1.11	.01	0	0	.04	.08	.04	0	0
10	.04	.04	2.46	2.92	.01	0	.04	.03	.11	.04	0	0
11	.04	.04	2.22	2.72	.01	0	.04	.03	.14	.04	0	0
12	.03	.04	2.22	2.92	.01	0	.04	.03	.10	.04	0	.07
13	.03	.04	2.22	2.46	.01	0	.04	.03	.04	.07	0	.28
14	.03	.04	2.28	2.34	0	0	.04	.03	.04	.06	0	.34
15	.03	1.35	2.22	2.40	0	0	.04	.03	.06	.04	0	1.53
16	.03	3.54	2.86	2.46	0	.01	.04	.03	.06	.04	0	2.10
17	.03	4.12	3.12	2.66	0	0	.04	.01	1.43	.04	0	2.04
18	.03	3.98	3.40	3.12	0	0	.04	.01	2.18	.04	0	1.92
19	.03	2.59	3.05	1.03	0	0	.03	.01	1.68	.03	0	1.86
20	.03	.04	3.05	.03	0	0	.03	.01	.04	.03	0	1.86
21	.03	.04	2.72	.04	0	0	.03	.01	.04	.03	0	1.86
22	.03	.04	2.60	.04	.01	0	.03	.01	.04	.01	0	1.86
23	.03	.03	1.92	.04	0	0	.01	.01	.04	.01	0	1.86
24	.03	.03	.03	.04	0	0	.01	0	.04	.01	0	1.80
25	.03	.03	.01	.04	.03	0	.01	0	.03	.01	0	2.28
26	.03	.03	0	.04	.03	0	.01	0	.03	.01	0	2.79
27	.03	.01	0	.04	.01	0	.01	0	.03	0	0	2.72
28	.03	.01	0	.04	.01	0	0	0	.03	0	0	2.98
29	.03	.01	0	.04	0	0	0	---------	.03	0	0	2.86
30	.03	.01	*0	.04	0	0	0	---------	.03	*0	0	*2.66
31	.03	*1.75	---------	.03	---------	*0	0	---------	.03	---------	0	---------
Total	22.08	32.69	59.56	26.60	0.26	0.01	0.53	0.48	6.35	1.04	0.23	35.67
Mean Mgd	0.712	1.05	1.99	0.858	0.009	0.0003	0.017	0.017	0.205	0.035	0.007	1.19
Cfs	1.10	1.62	3.08	1.33	0.014	0.0005	0.026	0.026	0.317	0.054	0.011	1.84
Ac-ft	68	100	183	82	0.8	0.03	1.6	1.5	19	3.2	0.7	109

Calendar Year 1964:	Max	4.28	Min	0	Mean mgd	0.686	Mean cfs	1.07	Ac-ft	770		
Fiscal Year 1964-65:	Max	4.12	Min	0	Mean mgd	0.508	Mean cfs	0.786	Ac-ft	569		

* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
Note.--No gage-height record July 12 to Aug. 3, Aug. 23-30, Sept. 25 to Oct. 8, Oct. 31 to Jan. 9, Jan. 19 to Feb. 4, Feb. 10 to Mar. 7, Mar. 25-30, Apr. 19 to May 3, May 6 to June 11.

932. Anahola Stream at Anahola

Location.--Lat 22°08'42", long 159°18'59", on downstream side of old highway bridge at Anahola, 0.1 mile upstream from State Highway 56, and 0.9 mile upstream from mouth. Prior to Nov. 20, 1964, crest-stage gage only, at same site.

Drainage area.--9.89 sq mi.

Records available.--Fiscal years 1962-65 (annual maximum), November 1964 to June 1965.

Gage.--Water-stage recorder. Datum of gage is mean sea level (by stadia survey). Apr. 12, 1962, to Nov. 19, 1964, crest-stage gage at same site and datum.

Extremes.--1964-65: Maximum discharge during fiscal year, 6,980 mgd (10,800 cfs) May 15 (gage height, 17.4 ft), from rating curve extended above 1,400 mgd on basis of contracted-opening measurement of peak flow; minimum during period November to June, 7.01 mgd (10.8 cfs) June 30.
1961-65: Maximum discharge, that of May 15, 1965.

Remarks.--Records good except those for May 15-17, which are fair. Anahola ditch (see page 38) and Lower Anahola ditch (see p. 40) divert above station for irrigation of sugarcane in vicinities of Kealia and Anahola, respectively.

Rating tables (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used Dec. 7, Apr. 13 to May 15)

Nov. 20 to May 15				May 16 to June 30			
2.9	8.40	5.0	128	3.4	5.40	4.5	60.5
3.0	10.7	6.0	245	3.6	10.7	5.0	103
3.5	27.5	7.0	390	4.0	30.2	6.0	220
4.0	52.5	9.0	870				

Discharge, in million gallons a day, November 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1					-	31.1	20.0	25.5	11.8	101	45.4	31.6
2					-	29.3	18.6	22.8	34.6	103	204	33.6
3					-	28.4	21.8	25.5	39.8	86.3	114	26.2
4			*/4.11		-	23.9	18.0	45.3	12.9	209	154	24.2
5					-	22.4	42.3	*192	28.0	79.5	383	21.2
6					-	21.0	162	74.1	66.7	90.2	95.2	18.2
7					-	20.7	34.7	61.0	23.2	53.2	68.5	17.2
8					-	20.0	33.4	36.5	17.3	35.2	55.5	16.2
9					-	41.1	51.0	40.1	15.0	36.0	55.3	15.7
10					-	63.3	236	28.8	68.9	65.3	44.2	14.8
11					-	196	50.8	26.3	70.7	75.4	38.0	14.3
12					-	196	35.6	24.7	28.4	48.0	59.4	13.8
13					-	140	34.2	22.8	21.8	374	41.5	14.3
14					-	201	*28.4	21.8	20.0	68.1	69.0	25.4
15					-	273	25.9	20.7	18.0	45.9	*750	27.4
16					-	246	24.3	20.0	14.4	41.0	220	*14.3
17					-	95.6	22.8	18.6	12.7	36.5	100	11.2
18					-	65.5	21.8	18.0	11.5	32.9	61.2	10.1
19				*/43.2	-	229	20.7	18.3	16.0	29.8	53.5	10.1
20					33.8	66.4	20.0	17.6	14.1	44.8	48.3	10.7
21					29.3	49.8	32.7	18.0	12.4	29.8	75.0	10.1
22					28.8	41.5	22.8	16.6	*11.8	26.3	78.1	10.1
23					24.7	39.0	19.0	*16.3	12.1	24.7	42.8	9.80
24					22.4	35.2	72.1	16.3	11.5	24.7	32.8	8.90
25					109	29.8	44.2	14.7	10.7	117	27.7	8.00
26					91.3	26.7	23.5	13.5	10.2	137	51.1	7.70
27					47.0	25.5	25.5	12.4	10.0	139	25.2	7.70
28					35.2	24.7	33.4	11.8	10.7	*84.4	29.7	16.7
29					42.5	22.1	156	---------	11.3	94.6	45.7	*8.60
30					37.0	20.7	34.7	---------	11.8	60.4	37.5	7.24
31			----------		----------	20.7	28.4	---------	129	----------	33.9	----------
Total					-	2345.4	1414.6	880.0	787.3	2393.0	3139.5	465.34
Mean												
Mgd					-	75.7	45.6	31.4	25.4	79.8	101	15.5
Cfs					-	117	70.6	48.6	39.3	123	156	24.0
Ac-ft						7200	4340	2700	2420	7340	9630	1430

Calendar Year 1964: Max - Min - Mean mgd - Mean cfs - Ac-ft -
Fiscal Year 1964-65: Max - Min - Mean mgd - Mean cfs - Ac-ft -

Peak discharge (base, 1,200 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
12-14	0600	10.43	1,420	2,200	5- 2	1800	11.35	1,880	2,910
12-16	1500	11.08	1,740	2,690	5- 4	0100	11.13	1,760	2,720
4- 4	0430	11.24	1,820	2,820	5-15	1700	17.4	6,980	10,800
4-13	0400	13.26	2,980	4,610					

* Discharge measurement made on this day.
/ Result of discharge measurement.

942. Ka Loko ditch near Kilauea

Location.--Lat 22°10'43", long 159°22'59", on left bank 35 ft downstream from Moloaa ditch, 400 ft upstream from Ka Loko Reservoir, and 3.5 miles southeast of Kilauea.

Records available.--August 1932 to June 1965.

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 754 ft above mean sea level (by stadia survey).

Average discharge.--32 years (1933-65), 3.41 mgd (5.28 cfs).

Extremes.--1932-65: Maximum daily discharge, 63 mgd (98 cfs) Dec. 10, 1935; minimum daily, 0.05 mgd (0.08 cfs) Apr. 30, May 1, 3, 1965.

Remarks.--Records good. Ditch diverts from Moloaa and Puu Ka Ele Streams at points 0.5 mile southeast and 1.5 miles southwest of station, respectively, for irrigation in vicinity of Kilauea.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.32	4.25	2.14	1.96	23.2	2.32	2.05	2.14	1.68	9.48	0.05	5.11
2	2.51	4.73	2.05	1.68	25.7	2.51	2.05	1.52	3.23	22.8	.11	4.73
3	2.42	3.44	2.92	2.05	26.0	2.42	2.23	1.29	3.89	11.3	.05	4.25
4	2.32	3.54	2.32	1.68	16.0	2.14	1.96	2.14	1.96	9.62	.08	4.01
5	2.32	3.23	1.86	10.5	15.6	2.05	2.18	2.30	2.14	1.13	.11	3.89
6	4.58	3.77	1.68	12.0	12.1	1.96	3.89	.58	7.01	.27	2.45	3.77
7	5.14	3.02	1.68	10.6	10.9	1.86	2.42	.53	2.60	2.00	5.21	3.44
8	10.4	6.38	1.60	4.01	10.6	*1.96	2.23	2.00	2.14	3.77	5.11	3.34
9	5.50	4.25	2.14	3.02	6.57	2.81	1.45	3.12	1.86	*3.77	5.24	3.12
10	3.44	*3.02	1.77	3.44	6.43	3.89	2.32	3.12	7.69	4.25	4.98	3.02
11	2.60	2.60	1.60	2.51	6.43	9.89	1.60	3.34	13.4	3.23	4.73	2.92
12	11.3	2.81	1.60	2.32	6.43	10.9	1.13	3.02	4.25	1.03	2.80	3.02
13	3.54	2.70	1.68	2.23	9.29	9.09	2.51	2.51	3.12	.20	.21	3.02
14	3.12	2.51	2.23	2.14	6.15	.64	2.92	2.23	2.81	3.38	2.54	3.65
15	4.25	2.81	1.86	2.81	7.56	.53	3.02	2.32	2.42	3.04	3.38	3.44
16	9.78	4.49	7.59	2.42	10.9	.41	3.02	2.51	2.23	.22	2.05	2.51
17	4.25	3.89	3.15	2.51	5.82	.32	2.92	2.42	2.14	.18	1.37	2.05
18	4.49	2.60	*8.48	11.8	4.49	.32	2.70	2.32	2.42	.18	1.21	1.96
19	4.38	3.65	2.81	8.77	4.49	.36	2.60	2.32	2.51	2.46	3.23	1.86
20	3.02	3.12	3.23	4.49	3.65	.36	2.51	2.32	2.23	3.77	4.01	2.05
21	3.12	2.60	2.23	*3.77	2.92	.36	*4.81	2.23	2.05	3.34	*2.03	1.77
22	2.92	2.60	2.23	3.34	1.45	1.72	2.81	2.05	1.96	3.02	2.14	1.77
23	14.8	4.06	2.32	6.33	3.34	2.42	2.42	2.05	2.05	2.92	1.29	1.68
24	6.71	2.70	1.96	11.0	4.37	2.14	4.16	*2.05	1.77	2.81	2.92	*1.68
25	24.4	2.32	1.86	4.37	3.12	1.96	4.50	1.86	1.77	3.12	3.77	1.60
26	13.8	2.14	1.77	3.34	.58	1.45	2.81	1.68	1.68	.22	6.71	1.45
27	5.76	2.14	1.68	3.12	.53	1.13	2.81	1.68	1.60	.14	4.98	1.45
28	4.98	2.05	1.68	4.01	.47	1.52	3.12	1.60	1.68	2.12	5.76	2.05
29	4.37	1.96	1.86	10.7	.47	1.68	7.93	---------	1.77	1.30	6.57	1.52
30	4.01	1.86	2.14	26.4	1.90	1.68	1.86	---------	1.96	.05	6.29	1.37
31	4.01	2.14	---------	30.5	---------	1.77	1.52	---------	13.8	---------	5.89	---------
Total	180.56	97.38	74.12	199.82	237.46	74.57	86.46	59.25	103.82	105.12	97.27	81.50
Mean												
Mgd	5.82	3.14	2.47	6.45	7.92	2.41	2.79	2.12	3.35	3.50	3.14	2.72
Cfs	9.00	4.86	3.82	9.98	12.3	3.73	4.32	3.28	5.18	5.42	4.86	4.21
Ac-ft	554	299	227	613	729	229	265	182	319	323	299	250

Calendar Year 1964:	Max	30.5	Min	0.32	Mean mgd	4.69	Mean cfs	7.25	Ac-ft	5.270		
Fiscal Year 1964-65:	Max	30.5	Min	0.05	Mean mgd	3.83	Mean cfs	5.93	Ac-ft	4.290		

* Discharge measurement made on this day.

950. Puu Ka Ele ditch near Kilauea

Location.--Lat 22°11'10", long 159°24'17", on left bank 200 ft upstream from Puu Ka Ele Reservoir and 2 miles south of Kilauea.

Records available.--August 1932 to June 1965.

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 426 ft above mean sea level (by stadia survey).

Average discharge.--32 years (1933-65), 2.51 mgd (3.88 cfs).

Extremes.--1932-65: Maximum daily discharge, 21 mgd (32 cfs) Sept. 2, 1943; no flow at times each year.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Ditch diverts from Puu Ka Ele Stream 0.8 mile south of station for irrigation of sugarcane in vicinity of Kilauea.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.29	3.72	1.57	1.48	1.34	0	2.58	0	2.88	0.37	0.01	0
2	2.38	4.62	1.57	1.41	1.48	0	2.48	.34	6.07	1.82	1.88	0
3	2.20	3.18	2.38	1.48	1.41	0	2.98	.59	9.89	1.74	1.20	0
4	2.29	3.08	1.84	1.41	.91	0	3.55	.34	3.38	.72	.65	0
5	2.38	2.78	1.48	5.48	.65	0	5.00	0	5.40	.80	2.52	0
6	3.60	2.98	1.41	7.60	.12	0	2.28	0	8.94	1.28	.65	0
7	3.28	2.58	1.41	7.20	.12	0	0	0	.15	.68	.18	2.70
8	6.69	4.05	1.34	3.08	.12	*0	0	0	.15	.12	0	3.49
9	4.16	3.72	1.48	2.48	0	0	.10	0	.15	*4.72	0	3.38
10	3.38	*2.58	1.34	2.58	0	0	1.15	.47	1.38	8.76	4.21	3.18
11	2.88	2.29	1.27	2.02	1.36	0	0	.49	1.13	7.62	5.62	3.08
12	7.58	2.58	1.41	1.84	4.50	0	0	0	.15	1.34	3.05	3.18
13	4.39	2.29	1.34	*1.66	4.62	0	0	0	.15	1.66	3.69	3.38
14	3.60	2.20	1.48	1.66	3.72	.94	0	0	.12	0	4.14	5.31
15	3.94	2.38	1.41	2.11	2.25	.08	0	2.02	.12	1.59	.98	5.78
16	5.86	4.16	4.78	1.66	.06	.65	0	4.16	.1	0	0	.82
17	4.05	3.60	*2.02	1.66	0	0	0	3.94	.1	0	1.06	0
18	3.94	2.48	4.92	5.74	0	0	0	3.83	.1	0	4.79	0
19	3.94	2.58	2.29	7.17	0	0	0	3.83	.84	0	6.04	0
20	3.28	2.68	2.29	2.98	0	0	0	3.72	1.84	0	5.75	0
21	3.08	1.00	1.66	2.38	0	0	*0	3.60	1.66	0	*9.17	1.02
22	2.88	.15	1.57	2.29	0	0	0	3.60	2.51	0	9.94	2.58
23	9.71	.15	1.48	3.72	0	0	0	3.49	3.38	0	7.20	2.48
24	6.91	.12	1.41	7.15	0	0	0	3.49	2.98	0	1.40	2.58
25	17.5	.12	1.34	3.38	0	0	0	*3.28	2.88	.58	0	*2.38
26	14.6	1.34	1.27	2.48	0	0	0	3.18	2.78	.64	.31	2.29
27	2.90	1.75	1.20	2.38	0	0	.24	2.98	2.78	1.07	0	2.29
28	.18	1.75	1.20	2.98	0	0	.39	2.88	2.88	0	4.04	2.46
29	.18	1.66	1.34	7.77	0	1.16	1.68	---------	2.98	.03	7.06	0
30	1.60	1.57	1.48	6.82	0	2.97	0	---------	2.68	.01	3.81	.80
31	3.60	1.57	---------	1.66	---------	2.68	0	---------	3.05	---------	0	---------
Total	139.25	71.71	52.98	105.71	22.66	8.48	22.43	50.23	73.60	35.55	89.35	53.18
Mean												
Mgd	4.49	2.31	1.77	3.41	0.755	0.274	0.724	1.79	2.37	1.18	2.88	1.77
Cfs	6.95	3.57	2.74	5.28	1.17	0.424	1.12	2.77	3.67	1.83	4.46	2.74
Ac-ft	427	220	163	324	70	26	69	154	226	109	274	163

Calendar Year 1964:	Max	17.5	Min	0	Mean mgd	2.27	Mean cfs	3.51	Ac-ft	2540		
Fiscal Year 1964-65:	Max	17.5	Min	0	Mean mgd	1.99	Mean cfs	3.08	Ac-ft	2220		

* Discharge measurement or observation of no flow made on this day.

Note.--No gage-height record Nov. 9, 10, Nov. 17 to Dec. 13, 17-28, Jan. 7, 8, 11-26, Jan. 30 to Feb. 1, 5-9, 12-14, Mar. 16-18, Apr. 14, 16-24, 28, May 8, 9, 16, 25, 27, May 31 to June 6, 17-20, 29.

952. Ross ditch near Kilauea

Location.--Lat 22°11'22", long 159°24'33", on left bank 1,000 ft downstream from intake and 1.7 miles south of Kilauea.

Records available.--October 1956 to June 1965.

Gage.--Water-stage recorder (digital) and Parshall flume. Datum of gage is 341 ft above mean sea level (by stadia survey). Prior to July 1, 1962, at datum 0.03 ft higher.

Average discharge.--8 years (1957-65), 2.53 mgd (3.91 cfs)

Extremes.--1956-65: Maximum daily discharge, 11.0 mgd (17.0 cfs) Apr. 15, 1963, Mar. 31, Apr. 13, 1965; no flow at times.

Remarks.--Records fair except those for period of no gage-height record, which are poor. Ditch diverts from Puu Ka Ele Stream for irrigation in vicinity of Kilauea.

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1964 TO JUNE 1965

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	1.6	3.3	1.8	1.7	8.3	3.4	0.90	3.5	1.3	7.0	1.5	7.9
2	1.6	4.5	1.8	1.4	8.1	3.1	.94	3.2	2.1	5.3	6.5	7.7
3	1.5	3.0	2.1	1.4	8.1	2.9	1.4	3.2	3.4	10	2.5	6.8
4	1.5	2.8	1.9	1.3	7.7	2.6	.32	4.5	1.6	7.8	3.5	7.1
5	1.5	2.7	1.8	3.8	7.6	2.4	1.3	7.0	2.1	7.7	5.0	6.3
6	2.7	2.7	1.7	5.3	7.2	2.2	7.5	5.5	5.8	8.5	5.0	5.8
7	2.2	2.5	1.6	5.6	7.0	2.0	3.7	4.8	4.7	7.7	4.0	3.2
8	4.9	3.4	1.6	2.7	6.9	*2.1	4.1	4.2	4.4	4.4	4.0	2.0
9	3.1	3.1	1.8	2.0	6.0	3.9	4.8	4.4	4.2	*3.0	5.0	1.9
10	2.4	*2.5	1.7	2.2	6.0	4.4	7.6	3.8	6.9	4.0	3.5	1.8
11	2.0	2.3	1.6	1.8	5.0	5.7	4.1	3.8	7.7	5.5	3.0	1.8
12	6.1	2.7	1.6	1.7	3.3	6.2	3.2	3.5	6.3	7.1	5.0	1.9
13	3.5	2.4	1.6	*1.6	4.2	6.3	3.0	3.3	5.9	11	3.5	2.0
14	2.5	2.3	1.6	1.5	3.1	8.3	2.7	3.2	5.8	8.0	5.0	2.8
15	2.6	2.5	1.7	1.9	3.7	7.4	2.5	2.4	5.6	5.8	7.5	3.6
16	4.2	4.1	4.2	1.7	7.1	7.1	2.3	.94	5.3	6.0	5.5	4.6
17	3.1	3.5	*2.7	1.7	7.6	6.0	2.1	.86	5.1	5.0	5.0	4.4
18	3.4	2.5	3.3	3.8	7.3	5.6	2.0	1.3	4.9	5.0	4.0	4.2
19	3.1	2.5	2.3	5.8	6.4	6.0	1.9	1.6	4.4	4.5	3.0	4.3
20	2.6	2.4	2.1	2.9	5.4	5.4	1.8	1.5	3.0	4.0	3.5	5.1
21	2.5	3.6	1.8	2.2	4.8	3.9	*3.4	1.5	3.0	4.0	*7.5	3.4
22	2.3	4.3	1.7	2.1	4.6	3.2	2.1	1.5	2.1	4.0	7.0	1.8
23	5.4	5.0	1.6	2.9	3.2	3.5	1.8	1.4	1.7	3.5	6.1	1.6
24	5.4	4.3	1.6	5.1	2.4	3.2	3.1	1.5	1.4	4.0	7.0	1.9
25	8.0	4.4	1.5	3.0	5.1	3.1	3.5	*1.4	1.4	8.0	7.4	*1.6
26	8.3	2.7	1.5	2.4	5.3	2.8	2.1	1.3	1.3	5.0	9.0	1.5
27	7.1	2.1	1.4	2.2	4.1	2.6	2.3	1.3	1.3	4.0	7.7	1.6
28	7.2	2.0	1.4	2.6	3.1	2.5	3.1	1.3	1.4	1.5	5.0	3.4
29	7.0	1.9	1.4	5.2	2.8	1.9	6.9	------	1.4	2.0	6.3	3.8
30	5.4	1.9	1.5	7.6	2.9	1.0	4.4	------	3.3	1.5	7.7	2.8
31	3.1	1.9	------	9.6	------	.98	3.7	------	11	------	8.5	------
TOTAL	117.8	91.8	55.9	96.7	164.3	121.68	94.56	77.70	119.8	164.8	164.7	108.6
MEAN												
MGD	3.80	2.96	1.86	3.12	5.48	3.93	3.05	2.78	3.86	5.49	5.31	3.62
CFS	5.88	4.58	2.88	4.83	8.48	6.08	4.72	4.30	5.97	8.49	8.21	5.60
AC-FT	362	282	172	297	504	373	290	238	368	506	505	333

CALENDAR YEAR 1964	MAX	11	MIN	.21	MEAN MGD	3.33	MEAN CFS	5.15	AC-FT	3,750
FISCAL YEAR 1964-65	MAX	11	MIN	.32	MEAN MGD	3.78	MEAN CFS	5.85	AC-FT	4,230

* Discharge measurement made on this day.
Note.--No gage-height record Apr. 14 to May 21.

959. Kalihiwai ditch above wasteway, near Kilauea

Location.--Lat 22°10'42", long 159°25'43", on left bank 1,800 ft upstream from wasteway gate, 0.7 mile upstream from Kalihiwai Reservoir, and 2.5 miles southwest of Kilauea.

Records available.--April 1960 to June 1965.

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 413.4 ft above mean sea level (by stadia survey).

Average discharge.--5 years, 3.96 mgd (6.13 cfs).

Extremes.--1960-65: Maximum daily discharge, 32.6 mgd (50.4 cfs) Mar. 31, 1965; minimum daily, 0.87 mgd (1.35 cfs) Feb. 7, 1961.

Remarks.--Records good. Ditch diverts from Pohakuhonu Stream for domestic use and irrigation of sugarcane in vicinity of Kilauea.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.64	3.26	1.90	2.54	19.2	3.58	3.05	2.95	2.08	9.01	15.6	3.81
2	2.54	4.96	1.99	2.17	26.5	3.15	2.85	2.85	8.01	10.6	21.7	3.58
3	2.64	3.05	3.04	2.17	19.5	2.95	2.95	3.15	7.22	13.5	21.2	3.05
4	2.64	2.95	2.08	2.08	13.2	*2.85	2.64	4.81	3.26	6.31	11.5	3.26
5	2.64	2.85	1.90	5.70	14.6	2.75	7.70	17.6	3.36	8.29	17.2	2.85
6	5.00	2.75	1.81	7.30	11.2	2.64	14.6	8.05	2.85	11.2	8.49	2.64
7	5.02	2.54	1.72	6.60	10.9	2.54	4.16	5.51	2.64	7.95	6.60	2.44
8	8.17	3.69	1.72	3.46	10.5	2.69	3.58	4.39	2.54	*4.87	5.51	2.35
9	5.26	3.26	1.99	2.95	8.49	7.16	7.42	6.64	2.54	4.87	5.00	2.35
10	3.81	*2.64	1.90	2.95	7.02	7.30	16.2	4.04	9.32	17.0	4.50	2.26
11	3.05	2.44	1.81	2.54	6.60	17.5	4.75	3.58	7.12	16.3	4.04	2.17
12	9.88	2.95	1.99	2.35	7.30	16.3	3.92	3.36	3.81	7.89	4.62	2.26
13	4.04	3.15	2.17	*2.17	8.19	23.1	3.58	3.15	3.36	20.3	3.92	2.35
14	3.36	2.75	2.75	2.17	5.76	27.4	*3.26	2.85	3.15	7.02	5.00	3.46
15	3.58	2.75	*2.54	2.44	8.05	14.1	3.15	2.75	2.85	5.51	4.62	4.04
16	5.60	5.43	7.12	2.17	14.9	18.9	2.95	2.64	2.64	4.87	4.04	2.85
17	3.69	4.27	3.15	2.17	13.5	8.94	2.85	2.54	2.95	4.27	3.46	2.35
18	3.92	2.95	4.75	6.51	8.79	7.65	2.75	2.44	2.85	3.92	3.26	2.26
19	4.96	3.05	3.15	6.31	7.90	11.6	2.64	2.44	2.54	3.58	3.26	2.26
20	3.46	2.75	3.58	3.26	5.51	5.89	2.54	2.35	2.35	3.26	3.36	2.64
21	3.26	2.54	2.75	3.05	4.75	5.00	5.65	2.26	2.35	3.05	3.36	3.46
22	3.05	2.35	3.46	2.95	4.27	4.39	3.05	2.26	2.26	2.95	3.26	3.46
23	11.2	2.75	2.95	4.16	3.81	4.50	2.64	2.17	2.54	2.75	3.05	2.17
24	6.60	2.35	2.54	7.62	3.46	3.92	8.68	*2.54	2.26	2.75	*2.95	*2.26
25	14.1	2.54	2.35	3.81	9.25	4.75	4.50	2.26	2.26	7.61	2.95	1.99
26	8.40	2.17	2.26	3.05	6.59	3.69	3.05	2.17	2.17	12.0	5.75	1.99
27	4.87	2.08	2.17	3.05	4.39	3.69	3.69	2.08	2.08	13.8	2.75	1.99
28	4.04	2.08	2.17	3.92	3.58	3.36	3.81	1.99	2.17	7.60	4.27	2.85
29	3.58	1.99	2.17	5.26	4.04	3.05	13.4	---------	2.26	10.3	5.39	2.26
30	3.26	1.90	2.35	24.0	3.58	3.26	4.04	---------	9.89	14.7	10.2	2.35
31	3.15	1.90	---------	21.8	---------	3.05	3.36	---------	32.6	---------	4.87	---------
Total	151.41	89.09	78.23	152.68	275.33	231.65	153.41	105.82	140.28	248.03	205.68	80.01
Mean												
Mgd	4.88	2.87	2.61	4.93	9.18	7.47	4.95	3.78	4.53	8.27	6.63	2.67
Cfs	7.55	4.44	4.04	7.63	14.2	11.6	7.66	5.85	7.01	12.8	10.3	4.13
Ac-ft	465	273	240	469	845	711	471	325	431	761	631	246

Calendar Year 1964:	Max	32.0	Min	1.54	Mean mgd	5.15	Mean cfs	7.97	Ac-ft	5,790
Fiscal Year 1964-65:	Max	32.6	Min	1.72	Mean mgd	5.24	Mean cfs	8.11	Ac-ft	5,870

* Discharge measurement made on this day.

960. Kalihiwai ditch near Kilauea

Location.--Lat 22°11'07", long 159°25'58", on right bank 0.1 mile upstream from Kalihiwai Reservoir and 2.4 miles southwest of Kilauea.

Records available.--June 1934 to June 1965.

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 409.2 ft above mean sea level (by stadia survey).

Average discharge.--31 years, 2.27 mgd (3.51 cfs).

Extremes.--1934-65: Maximum daily discharge, 29.5 mgd (45.6 cfs) July 16, 1937; no flow at times.

Remarks.--Records good except those for period of no gage-height record, which are poor. Ditch diverts low flow of most branches of Pohakuhonu Stream at intakes about 1 mile south of station. Water discharges into Kalihiwai Reservoir, where it is stored for irrigation of sugarcane in vicinity of Kilauea.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.44	3.0	1.38	1.96	0.67	0.07	0.33	0.20	1.46	0.07	0.80	0.44
2	2.44	4.5	1.46	1.54	.73	.07	.29	1.07	5.20	1.21	1.20	.38
3	2.64	3.0	2.05	1.54	.73	.05	.24	2.64	3.26	.67	1.02	.33
4	2.64	3.0	1.46	1.46	.55	.05	.20	2.70	.33	.44	.67	.33
5	2.74	3.0	1.38	5.15	.55	.07	.24	.80	.33	.38	.67	.29
6	5.28	3.0	1.30	7.22	.49	.07	.44	.49	.24	.55	.49	.29
7	5.08	2.5	1.30	6.62	.38	.07	.20	.38	.20	.44	2.65	.24
8	8.79	3.5	1.16	3.25	.44	.03	.20	.33	.20	*.33	3.46	.24
9	5.54	3.0	1.30	2.64	.33	.04	.24	.44	.70	2.20	3.25	1.34
10	4.04	*2.0	1.30	2.74	.29	.95	.29	1.46	2.63	6.00	2.95	1.96
11	3.25	1.87	1.23	2.24	.20	5.64	.10	2.21	.44	6.34	1.21	1.87
12	11.9	2.24	1.46	1.96	.20	5.80	.07	1.23	.29	2.00	.49	1.96
13	4.04	2.34	1.54	*1.78	.20	6.52	.05	2.54	.24	1.02	1.67	1.96
14	3.15	2.05	1.78	1.70	.16	1.62	*.07	2.44	.16	.55	1.75	.97
15	3.5	2.24	*1.78	2.05	.13	.80	.10	2.24	.16	.38	.44	.38
16	5.5	3.35	5.38	1.70	.20	.95	.07	2.14	.10	.33	.33	.20
17	3.5	3.05	2.84	1.70	.20	.61	.05	1.96	.10	.29	.58	.16
18	4.0	2.24	4.38	3.68	.16	.49	.80	1.87	.05	.29	1.52	.13
19	5.0	2.24	2.64	.67	.16	.38	1.96	1.78	.04	.24	2.24	.10
20	3.5	2.05	3.05	.33	.16	.33	1.26	1.78	.03	.20	2.34	.10
21	3.0	1.78	2.05	.20	.13	.29	.38	1.78	.03	1.05	2.34	.07
22	2.5	1.70	2.84	.20	.13	.24	.29	1.70	.01	2.34	2.34	.07
23	7.0	2.05	2.14	.20	.10	.24	.20	1.62	.01	1.65	2.24	.07
24	1.5	1.70	1.78	.24	.10	.24	.44	*1.87	.01	.44	*1.53	.07
25	2.0	1.78	1.62	.20	.13	.24	.33	1.70	.01	.61	.29	.51
26	1.0	1.54	1.46	.16	.07	.24	.24	1.62	.01	.80	.44	1.46
27	.8	1.46	1.46	.16	.07	.24	.24	1.54	0	.87	.24	1.54
28	.7	1.38	1.30	.16	.07	.94	.29	1.46	.02	.67	.38	2.14
29	3.0	1.30	1.38	.16	.07	2.34	.44	---------	.02	.73	.44	.92
30	3.0	1.30	1.62	.49	.07	1.44	.24	---------	.07	.80	.55	.20
31	2.5	1.30	---------	.73	---------	.44	.24	---------	.41	---------	.49	---------
Total	115.97	71.46	57.82	54.83	7.87	31.50	10.53	43.99	16.76	33.89	41.01	20.72
Mean												
Mgd	3.74	2.31	1.93	1.77	0.262	1.02	0.340	1.57	0.541	1.13	1.32	0.691
Cfs	5.79	3.57	2.99	2.74	0.405	1.58	0.526	2.43	0.837	1.75	2.04	1.07
Ac-ft	356	219	177	168	24	97	32	135	51	104	126	64

Calendar Year 1964:	Max	13	Min	0	Mean mgd	1.32	Mean cfs	2.04	Ac-ft	1490
Fiscal Year 1964-65:	Max	11.9	Min	0	Mean mgd	1.39	Mean cfs	2.15	Ac-ft	1550

* Discharge measurement made on this day.
Note.--No gage-height record July 15 to Aug. 10.

970. Pohakuhonu Stream near Kilauea

Location.--Lat 22°10'52", long 159°25'40", on left bank 0.8 mile upstream from confluence with Halaulani Stream, 1.2 miles upstream from Stone Dam, and 2.5 miles southwest of Kilauea.

Drainage area.--1.8 sq mi, approximately.

Records available.--October 1957 to June 1965.

Gage.--Water-stage recorder. Datum of gage is 401.7 ft above mean sea level (by stadia survey).

Average discharge.--7 years (1958-65), 5.51 mgd (8.53 cfs).

Extremes.--Maximum discharge during year, 1,280 mgd (1,980 cfs) Dec. 14 (gage height, 6.08 ft), from rating curve extended above 420 mgd as explained below; minimum, 1.28 mgd (1.98 cfs) Mar. 18, 26, 27.

1957-65: Maximum discharge, 1,750 mgd (2,710 cfs) Aug. 6, 1959 (gage height, 7.23 ft, from floodmark in well), from rating curve extended above 420 mgd on basis of slope-area measurement at gage height 11.0 ft; minimum, 0.80 mgd (1.24 cfs) June 27, 28, 1959.

Maximum stage known, 11.0 ft Jan. 24, 1956, from floodmark (discharge, 3,620 mgd, 5,600 cfs, from slope-area measurement of peak flow).

Remarks.--Records good. Kalihiwai ditch (see p. 45) diverts about 0.5 mile above station for domestic supply and irrigation of sugarcane. Continuous records of rainfall are obtained at station.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.3	0.88	1.1	26.2
.4	1.80	1.5	57.5
.5	3.20	2.0	117
.6	5.30	2.5	199
.8	11.5		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.50	3.62	1.94	2.22	27.8	3.62	2.78	3.20	2.08	13.7	22.0	5.09
2	2.50	5.09	2.08	1.69	73.5	3.20	2.64	3.06	11.0	41.2	118	4.25
3	2.50	3.20	2.92	1.58	38.0	2.92	2.78	3.41	10.0	41.1	39.4	3.62
4	2.78	2.92	2.22	1.48	14.8	*2.64	2.50	6.37	2.64	6.75	15.5	4.04
5	2.64	2.92	1.94	5.87	17.2	2.50	23.4	38.1	2.36	11.7	38.6	3.62
6	5.30	2.78	1.80	8.20	10.8	2.50	35.5	9.52	2.08	14.2	10.2	3.20
7	5.87	2.50	1.80	7.04	11.2	2.36	4.67	5.88	1.80	10.3	7.62	2.92
8	10.3	4.04	1.80	3.06	10.2	2.50	3.83	5.29	1.69	*5.30	6.17	2.64
9	5.30	3.41	2.08	2.50	7.91	7.62	15.1	7.66	1.80	5.30	5.59	2.64
10	4.04	*2.64	1.80	2.64	5.88	7.33	60.6	4.04	17.1	50.6	4.67	2.50
11	3.06	2.36	1.80	2.22	5.88	38.0	4.88	3.62	8.93	69.0	4.25	2.36
12	17.5	3.06	1.69	1.94	8.20	28.8	4.04	3.41	3.06	10.0	5.09	2.50
13	4.25	3.41	1.58	*1.80	8.53	42.4	3.83	3.06	2.50	87.5	4.25	2.50
14	3.41	2.78	2.08	1.80	5.30	104	*3.20	2.92	2.36	7.62	5.59	3.62
15	3.62	2.92	*1.94	2.22	6.46	18.5	3.20	2.78	2.08	5.88	5.59	4.25
16	6.17	6.48	7.90	1.80	19.9	69.4	3.06	2.64	1.80	5.09	4.25	3.06
17	4.25	5.09	2.50	1.80	17.2	9.52	2.92	2.50	1.38	4.46	3.83	2.50
18	4.46	3.41	4.25	8.98	9.85	7.85	2.78	2.36	1.28	3.83	3.41	2.36
19	5.09	3.62	2.78	7.66	8.53	15.5	2.64	2.36	1.48	3.62	3.06	2.50
20	3.62	3.06	2.92	3.20	6.17	6.17	2.64	2.36	1.58	3.20	2.64	2.78
21	3.41	2.78	2.36	2.78	5.09	4.88	6.75	2.22	1.48	3.06	3.06	2.36
22	3.06	2.64	2.64	2.64	4.46	4.46	3.20	2.22	1.48	2.92	2.78	2.50
23	18.1	3.06	2.36	4.04	3.62	4.67	2.78	2.08	1.69	2.78	2.50	2.36
24	8.20	2.64	2.08	10.0	3.20	3.83	18.1	*2.36	1.38	2.78	*2.36	*2.36
25	28.3	2.78	1.94	3.62	12.1	5.09	5.30	2.08	1.38	13.2	2.36	2.22
26	10.9	2.36	1.80	2.92	7.62	3.62	3.41	1.80	1.28	24.5	7.48	2.22
27	5.30	2.22	1.69	2.92	4.88	3.62	4.25	1.80	1.28	24.0	3.20	2.22
28	4.46	2.08	1.58	3.83	3.83	3.20	4.46	1.80	1.38	8.86	5.30	3.20
29	3.83	1.94	1.69	6.17	4.04	2.92	31.7	---------	1.48	12.3	7.33	2.36
30	3.41	1.94	1.80	88.3	3.41	3.06	4.46	---------	48.1	20.4	15.9	1.80
31	3.41	1.94	---------	42.3	---------	2.92	3.62	---------	1.85	---------	6.75	---------
Total	191.54	95.69	69.76	239.22	365.56	419.60	275.02	130.90	324.93	515.15	368.73	86.55
Mean												
Mgd	6.18	3.09	2.33	7.72	12.2	13.5	8.87	4.68	10.5	17.2	11.9	2.88
Cfs	9.56	4.78	3.61	11.9	18.9	20.9	13.7	7.24	16.2	26.6	18.4	4.46
Ac-ft	588	294	214	734	1120	1290	844	402	997	1580	1130	266

Calendar Year 1964:	Max	108	Min	1.02	Mean mgd	7.22	Mean cfs	11.2	Ac-ft	8110
Fiscal Year 1964-65:	Max	185	Min	1.28	Mean mgd	8.45	Mean cfs	13.1	Ac-ft	9460

* Discharge measurement made on this day.

Peak discharge (base, 500 mgd, revised)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-30	1900	4.63	760	1,180	4- 3	1400	3.92	541	837
12-14	0530	6.08	1,280	1,980	4-11	0300	5.03	900	1,390
12-16	1400	4.29	652	1,010	4-13	0400	4.43	694	1,070
1-10	0100	3.90	535	828	5- 2	1730	5.33	1,010	1,560
3-31	0730	5.15	942	1,460					

975. Halaulani Stream at altitude 400 ft, near Kilauea

Location.--Lat 22°10'54", long 159°25'17", on left bank 0.5 mile upstream from confluence with Pohakuhonu Stream, 1 mile upstream from Stone Dam, and 2.5 miles south of Kilauea.

Drainage area.--1.1 sq mi, approximately.

Records available.--November 1957 to June 1965.

Gage.--Water-stage recorder. Datum of gage is 391.8 ft above mean sea level (by stadia survey).

Average discharge.--7 years (1958-65), 7.96 mgd (12.3 cfs).

Extremes.--Maximum discharge during year, 888 mgd (1,370 cfs) Dec. 14 (gage height, 6.73 ft), from rating curve extended above 130 mgd as explained below; minimum, 3.28 mgd (5.07 cfs) Sept. 8, 9.
1957-65: Maximum discharge, 1,340 mgd (2,070 cfs) Aug. 6, 1959 (gage height, 8.30 ft), from rating curve extended above 130 mgd on basis of slope-area measurement of peak flow; minimum, 2.32 mgd (3.59 cfs) Feb. 20-23, 27, 28, Mar. 4, 1963.

Remarks.--Records good. No diversion above station.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.8	2.40	2.0	41.0
1.0	4.85	2.5	79.0
1.2	8.80	3.0	130
1.5	17.8		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	5.20	5.72	3.77	4.31	33.0	7.26	5.20	5.38	4.44	16.5	20.4	9.06
2	5.20	7.87	3.77	3.77	67.2	6.42	4.72	4.85	13.6	38.2	85.4	7.92
3	5.38	5.02	6.26	3.90	48.5	6.08	5.20	5.55	17.3	43.0	30.3	6.60
4	5.38	4.85	4.04	3.39	22.8	5.55	4.58	10.5	5.90	12.0	21.8	7.04
5	5.02	4.72	3.64	13.8	25.4	5.20	19.0	36.0	7.17	17.6	37.9	6.08
6	8.58	4.72	3.50	17.7	20.0	4.85	37.9	16.9	5.90	19.5	15.8	5.72
7	10.9	4.18	3.39	15.8	18.6	4.72	8.14	13.5	5.02	15.0	11.7	5.38
8	17.0	7.96	3.28	7.04	18.2	*5.02	7.26	9.06	4.72	8.58	9.58	5.20
9	11.4	5.90	3.90	5.55	13.2	14.2	14.2	11.6	4.85	*10.1	9.84	4.85
10	7.70	*4.58	3.50	6.08	10.6	14.8	48.4	7.48	28.7	33.3	7.70	4.72
11	6.08	4.31	3.50	4.72	9.06	42.1	8.36	6.82	16.6	38.9	6.82	4.72
12	21.8	5.38	3.50	4.31	11.7	38.3	6.60	6.60	7.92	16.9	11.0	5.02
13	8.14	5.02	3.50	4.04	15.9	37.3	6.25	6.08	6.42	80.5	7.26	5.20
14	6.60	4.58	4.44	3.90	9.58	79.7	5.55	5.72	6.08	13.2	10.9	9.90
15	7.92	5.20	4.44	4.58	10.1	31.8	5.20	5.55	5.55	9.58	19.7	10.6
16	11.7	8.64	13.7	3.90	25.8	49.1	4.85	5.20	5.20	8.36	9.58	6.42
17	7.48	7.48	*5.72	3.77	26.4	15.1	4.58	5.02	5.02	7.04	7.48	5.02
18	9.06	5.20	10.6	18.2	16.0	11.7	4.44	4.85	4.72	6.42	6.60	5.02
19	10.1	6.25	5.55	14.7	15.8	20.8	4.44	4.85	4.72	5.90	6.25	5.38
20	7.04	5.38	6.25	6.82	10.1	9.06	4.44	4.85	4.58	5.55	6.08	6.25
21	6.60	4.58	4.72	*6.42	8.36	7.26	*9.24	4.72	4.44	5.20	*14.5	5.20
22	6.25	4.44	5.20	5.90	7.48	6.42	4.85	4.72	4.31	5.02	7.92	5.02
23	22.7	5.90	4.72	9.06	6.25	7.88	4.58	4.58	4.58	4.72	6.25	4.85
24	14.1	4.58	4.18	19.1	5.90	6.25	14.3	5.02	4.31	4.72	5.55	5.02
25	33.2	5.02	4.04	7.26	20.0	8.36	7.92	*4.58	4.18	22.5	5.55	*4.58
26	17.0	4.18	3.77	6.08	13.0	6.25	5.38	4.44	4.04	33.3	13.1	4.58
27	9.06	3.90	3.64	5.55	7.92	5.90	8.16	4.31	4.04	28.6	6.25	4.58
28	7.26	3.77	3.50	7.48	6.82	5.55	7.26	4.31	4.18	14.7	10.5	7.39
29	6.25	3.64	3.64	12.2	9.08	5.02	30.7	---------	4.31	17.8	12.6	4.85
30	5.72	3.50	4.04	61.7	6.82	5.20	7.26	---------	15.6	18.9	16.5	4.44
31	5.72	3.77	---------	47.1	---------	5.02	5.90	---------	93.5	---------	10.1	---------
Total	311.54	160.24	141.70	338.13	519.57	478.17	314.86	213.04	311.90	561.59	450.91	176.61
Mean												
Mgd	10.0	5.17	4.72	10.9	17.3	15.4	10.2	7.61	10.1	18.7	14.5	5.89
Cfs	15.5	8.00	7.30	16.9	26.8	23.8	15.8	11.8	15.6	28.9	22.4	9.11
Ac-ft	956	492	435	1,040	1,590	1,470	966	654	957	1,720	1,380	542

Calendar Year 1964: Max 79.7 Min 3.17 Mean mgd 10.1 Mean cfs 15.6 Ac-ft 11,310
Fiscal Year 1964-65: Max 93.5 Min 3.28 Mean mgd 10.9 Mean cfs 16.9 Ac-ft 12,200

* Discharge measurement made on this day.

Peak discharge (base, 300 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-30	2000	5.24	518	801	3-31	0700	5.74	640	990
12-14	0600	6.73	888	1,370	4- 3	1500	4.84	438	678
12-16	1500	4.57	384	594	4-13	0400	6.05	718	1,110
1-10	0100	4.62	394	610	5- 2	1730	5.92	685	1,060

1000. Hanalei tunnel outlet near Lihue

Location.--Lat 22°04'57", long 159°27'52", on right bank at outlet of Hanalei tunnel, 2.2 miles downstream from intake on Kaapoko Stream, and 9.8 miles northwest of Lihue.

Records available.--July 1932 to June 1965.

Gage.--Water-stage recorder and sharp-crested weir. Altitude of gage is 1,210 ft (from tunnel-profile).

Average discharge.--33 years, 17.9 mgd (27.7 cfs).

Extremes.--1932-65: Maximum daily discharge, 64 mgd (99 cfs) Apr. 11, 25, 26, 1942; no flow at times.

Remarks.--Records good. Tunnel diverts water from Kaapoko Stream and Hanalei River into North Branch of North Fork Wailua River, from which it is later diverted for irrigation in vicinity of Lihue and Kapaa.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	*11.5	22.1	*17.6	26.5	31.5	20.8	11.1	3.65	3.94	13.4	10.7	13.4
2	11.9	25.0	15.5	*19.8	33.0	*20.8	12.3	*3.40	7.71	*14.2	25.1	11.9
3	11.5	*19.0	18.5	20.8	29.0	19.0	15.4	7.71	*6.30	15.9	27.1	11.9
4	11.9	19.0	15.5	18.5	*31.0	17.6	12.2	10.2	4.24	13.8	23.0	*11.5
5	10.7	20.8	19.4	26.5	30.5	17.2	*16.1	19.4	4.24	22.1	23.0	11.5
6	15.9	19.8	17.2	28.0	27.0	16.8	20.3	9.93	4.24	26.0	15.1	11.1
7	16.4	18.1	15.1	30.5	30.5	16.4	13.0	11.5	4.24	19.4	13.0	10.3
8	16.4	24.5	14.2	24.0	29.5	17.2	14.9	6.97	3.94	13.4	15.6	10.3
9	15.5	21.2	20.3	21.6	25.5	22.1	17.8	8.86	3.94	18.5	13.4	10.3
10	11.9	22.1	18.1	20.8	23.5	28.5	19.5	5.42	6.60	34.5	12.6	10.3
11	9.93	18.1	17.2	18.5	22.6	31.0	11.9	4.83	9.19	26.5	14.2	10.3
12	18.6	21.2	18.1	18.1	25.5	31.0	13.0	4.83	15.9	17.2	12.2	11.1
13	12.6	21.2	16.8	17.6	27.0	30.0	13.8	4.54	15.9	23.4	15.1	11.9
14	11.5	21.6	17.6	16.8	22.1	34.0	10.7	4.54	16.4	11.1	23.5	16.6
15	14.2	20.8	18.1	24.7	26.0	29.0	10.7	4.54	15.9	9.93	13.4	15.6
16	17.6	21.2	28.0	17.2	26.0	28.2	10.3	4.54	17.2	9.19	12.2	13.4
17	14.2	27.0	20.8	16.0	25.5	18.5	10.7	4.24	18.5	8.82	11.9	11.9
18	22.6	19.8	23.0	21.2	23.5	29.2	9.56	4.24	18.1	8.45	11.9	11.5
19	19.4	21.6	19.4	23.5	25.0	25.6	9.56	4.54	19.0	8.45	11.9	9.56
20	18.1	19.0	24.0	21.2	21.2	18.5	10.3	4.54	18.5	8.45	11.1	9.19
21	19.8	18.1	19.8	23.0	21.6	15.9	11.9	4.24	18.1	8.08	12.2	8.45
22	18.1	18.1	23.5	19.8	27.5	15.9	10.3	4.54	18.1	7.71	13.5	8.82
23	27.2	19.8	22.1	21.6	20.8	20.0	13.9	4.24	20.8	7.71	12.6	8.45
24	29.0	17.6	20.8	24.5	20.3	13.8	21.0	6.01	19.8	7.71	11.5	8.45
25	35.0	17.2	19.0	20.8	31.5	13.4	11.1	4.54	19.0	14.7	11.1	8.08
26	29.5	16.4	18.5	21.6	25.5	12.6	10.3	4.24	18.1	15.9	13.8	8.08
27	22.6	15.5	17.6	22.6	22.1	13.8	11.5	4.24	18.1	16.8	11.9	8.45
28	21.2	15.1	17.6	21.6	20.8	13.8	10.7	4.24	18.5	19.0	12.2	12.6
29	20.8	15.9	19.4	21.6	19.8	13.0	9.86	---------	20.8	17.6	12.6	8.82
30	20.3	14.6	24.0	28.1	19.0	15.9	3.94	---------	29.1	13.0	15.5	8.45
31	19.8	16.4	----------	35.5	----------	13.4	4.54	---------	22.9	----------	12.2	----------
Total	555.63	607.8	576.7	692.5	764.3	632.9	382.16	168.71	437.28	450.90	455.1	322.20
Mean												
Mgd	17.9	19.6	19.2	22.3	25.5	20.4	12.3	6.03	14.1	15.0	14.7	10.7
Cfs	27.7	30.3	29.7	34.5	39.5	31.6	19.0	9.33	21.8	23.2	22.7	16.6
Ac-ft	1,710	1,870	1,770	2,130	2,350	1,940	1,170	518	1,340	1,380	1,400	989

Calendar Year 1964:	Max	43.6	Min	9.93	Mean mgd	22.4	Mean cfs	34.7	Ac-ft	25,210
Fiscal Year 1964-65:	Max	35.5	Min	3.40	Mean mgd	16.6	Mean cfs	25.7	Ac-ft	18,570

* Discharge measurement made on this day.

1030. Hanalei River near Hanalei

Location.--Lat 22°11'31", long 159°27'57", on right bank 2.3 miles southeast of Hanalei and 4.9 miles upstream from mouth.

Drainage area.--19.1 sq mi.

Records available.--January 1912 to November 1919, December 1962 to June 1965.

Gage.--Water-stage recorder. Datum of gage is 35.8 ft above mean sea level (by stadia survey). Jan. 1, 1912, to Nov. 20, 1919, staff gage at site 0.2 mile upstream at different datum.

Extremes.--Maximum discharge during year, 28,200 mgd (43,600 cfs) May 2 or 3 (gage height, 14.1 ft), from rating curve extended above 1,800 mgd; minimum, 41.5 mgd (64.2 cfs) Mar. 27.
1912-19, 1962-65: Maximum discharge, that of May 2 or 3, 1965; minimum, 24.9 mgd (38.5 cfs) Mar. 4, 1963.

Remarks.--Records good except those above 3,000 mgd, which are fair, and those for periods of no gage-height record, which are poor. Since 1925 Hanalei tunnel (see preceding page) has diverted from Hanalei River and its tributary Kaapoko Stream above station to North Branch of North Fork Wailua River for irrigation.

Rating table (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used July 1-17, Feb. 9 to Apr. 5, Apr. 9, 15-23, May 7)

1.5	34.0	4.0	530
2.0	63.0	4.5	810
2.5	113	5.0	1,180
3.0	200	6.0	2,100
3.5	330		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	75.5	120	62.3	216	726	99.9	94.4	90.0	56.7	170	250	200
2	85.0	180	59.5	85.3	1,570	91.1	98.0	84.0	323	177	1,500	170
3	97.7	90	100	80.2	1,010	85.0	141	225	245	247	2,000	150
4	97.7	70	63.0	63.8	592	73.7	79.1	400	88.0	127	500	130
5	82.0	75.5	62.3	208	626	67.8	277	1,140	75.5	612	437	120
6	163	90.0	58.1	314	423	64.6	612	409	69.4	687	252	100
7	206	65.4	54.8	418	639	62.3	142	482	64.6	425	176	90
8	260	126	50.6	142	474	64.6	135	235	62.3	*186	150	80
9	186	105	87.3	111	326	353	299	415	59.5	216	120	80
10	117	77.3	67.0	107	214	880	732	146	251	1,090	90	*75
11	86.0	63.0	63.0	79.1	164	1,270	151	120	121	952	100	100
12	302	82.7	75.5	71.0	258	1,010	124	107	71.0	272	90	150
13	130	81.0	64.6	65.4	260	1,100	152	94.4	63.0	1,110	150	200
14	98.8	92.2	75.5	61.6	142	1,380	97.7	87.0	65.4	208	600	400
15	121	107	69.4	93.4	416	482	89.0	82.0	58.1	142	200	250
16	225	118	*338	67.0	458	788	83.0	80.0	53.0	120	110	200
17	*120	248	116	63.0	426	274	81.0	73.7	50.0	105	100	150
18	150	95.5	205	379	267	647	76.4	*69.4	48.2	92.2	90	130
19	120	120	98.8	210	307	757	71.0	71.9	48.8	84.0	100	150
20	100	86.0	136	145	154	210	69.4	73.7	47.0	79.1	90	160
21	110	73.7	88.0	120	126	170	168	75.5	44.0	74.6	80	110
22	100	70.2	172	98.2	190	139	81.0	71.0	43.5	69.4	90	120
23	400	121	108	157	103	293	89.4	67.8	64.2	70.2	90	100
24	450	77.3	96.8	237	91.1	128	593	97.2	48.8	70	85	110
25	600	75.5	71.9	116	567	113	147	86.4	45.2	150	80	100
26	150	63.8	65.4	*166	274	99.9	95.5	65.4	43.0	400	200	90
27	100	60.9	60.9	177	140	106	*144	62.3	41.5	500	120	150
28	90	58.1	59.5	151	109	103	138	58.8	43.5	500	150	*300
29	80	56.7	64.6	141	97.7	86.0	453	---------	54.8	600	200	150
30	80	54.8	162	1,170	89.0	118	124	---------	460	400	250	110
31	80	58.1	---------	1,220	---------	99.9	108	---------	1,280	---------	180	---------
Total	5,062.7	2,862.7	2,855.8	6,733.0	11,238.8	11,215.8	5,744.9	5,069.5	4,089.0	9,935.5	8,630	4,425
Mean												
Mgd	163	92.3	95.2	217	375	362	185	181	132	331	278	148
Cfs	252	143	147	336	580	560	286	280	204	512	430	229
Ac-ft	15,540	8,790	8,760	20,660	34,490	34,420	17,630	15,560	12,550	30,490	26,480	13,580

Calendar Year 1964: Max 3,000 Min 39.0 Mean mgd 203 Mean cfs 314 Ac-ft 228,000
Fiscal Year 1964-65: Max 2,000 Min 41.5 Mean mgd 213 Mean cfs 330 Ac-ft 239,000

Peak discharge (base, 3,600 mgd, revised)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
probably 7-25	-	8.31	5,520	8,540	3-31	0300	10.03	9,590	14,800
					4- 5	1930	13.34	23,600	36,500
12-14	0630	7.87	4,690	7,250	4-13	0400	8.18	5,260	8,140
12-16	1330	12.48	19,000	29,400	5- 2				
1- 5	2300	7.27	3,700	5,720	or	-	14.1	28,200	43,600
1-10	0030	7.42	3,930	6,080	5- 3				

* Discharge measurement made on this day.
Note.--No gage-height record July 18 to Aug. 4, Apr. 24 to May 4, May 8 to June 30.

1080. Wainiha River near Hanalei

Location.--Lat 22°08'10", long 159°33'40", on left bank at Puwainui Falls, 1.5 miles upstream from Wainiha powerplant intake, and 6.0 miles southwest of Hanalei.

Drainage area.--10.2 sq mi.

Records available.--August 1952 to February 1956, October 1957 to June 1965.

Gage.--Water-stage recorder. Altitude of gage is 960 ft (from topographic map).

Average discharge.--9 years (1953-55, 1958-65), 90.0 mgd (139 cfs).

Extremes.--Maximum discharge during year, 9,650 mgd (14,900 cfs) May 3 (gage height, 7.60 ft), from rating curve extended above 660 mgd as explained below; minimum, 33.1 mgd (51.2 cfs) Aug. 30, 31, Sept. 8.

1952-65: Maximum discharge recorded, 13,000 mgd (20,100 cfs) Aug. 6, 1959 (gage height, 8.19 ft), from rating curve extended above 660 mgd on basis of slope-area measurement at gage height 7.72 ft; minimum, 22.5 mgd (34.8 cfs) Feb. 12, 1954.

Flood of Feb. 17, 1956, which destroyed the station, reached a stage of about 14.1 ft (discharge not determined).

Remarks.--Records good. No diversion above station.

Rating table (gage height, in feet, and discharge, in million gallons a day)

1.4	32.0	3.0	300
1.7	51.5	3.5	530
2.1	92.0	4.0	850
2.5	158	4.5	1,350

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	81.1	78.1	58.6	263	480	73.3	54.9	49.2	*42.4	54.7	106	99.2
2	90.2	144	44.3	92.0	635	59.2	90.9	43.4	157	53.5	956	80.7
3	90.8	51.5	70.2	72.8	477	50.0	101	283	159	77.2	1,010	72.8
4	84.8	42.7	42.7	50.8	436	43.4	48.5	303	83.6	56.7	152	69.5
5	72.6	55.8	47.0	179	509	40.1	153	445	63.8	385	134	64.0
6	144	59.2	44.8	186	262	38.8	227	204	50.8	582	79.8	51.5
7	126	39.4	36.4	198	549	*38.2	88.4	260	44.0	281	63.8	45.5
8	204	113	34.2	84.8	446	40.1	74.8	120	40.1	120	57.4	42.7
9	112	67.3	73.2	72.6	205	97.7	267	139	39.4	148	50.0	*40.8
10	74.8	51.5	59.2	66.5	131	580	347	83.6	104	420	45.5	39.4
11	56.6	37.5	50.8	47.0	105	685	94.6	67.6	63.8	157	55.1	39.4
12	154	68.5	62.3	40.1	151	520	97.4	67.6	51.5	123	47.0	76.2
13	74.8	72.3	53.2	36.4	123	441	185	55.8	47.0	455	95.4	95.7
14	64.8	83.6	60.8	34.8	67.6	660	81.2	46.2	44.0	93.3	319	209
15	108	77.9	59.5	86.7	105	169	63.8	42.7	40.1	66.6	73.7	121
16	170	70.3	308	44.0	134	402	57.4	44.0	38.2	54.9	59.2	85.0
17	94.6	305	89.6	37.5	124	124	64.8	40.1	36.4	50.0	53.2	69.2
18	101	77.9	125	92.5	104	398	46.2	38.2	35.3	45.5	48.5	60.0
19	70.6	105	67.6	117	150	401	42.7	53.2	34.8	*42.0	54.9	74.3
20	58.3	62.8	117	92.0	87.2	138	44.8	59.2	34.2	40.1	51.5	76.3
21	69.9	53.2	61.9	86.4	92.3	111	77.9	50.0	34.2	38.8	44.8	52.4
22	63.2	49.2	64.5	61.9	327	111	*44.8	53.2	33.6	38.2	48.7	58.7
23	471	78.6	54.7	101	95.9	283	73.4	55.8	58.8	37.5	47.8	49.2
24	224	54.0	52.4	152	73.7	101	107	106	50.0	37.0	43.4	54.3
25	361	48.5	42.7	102	537	76.8	43.4	89.6	47.0	73.3	42.0	44.0
26	131	41.4	38.2	147	263	63.8	40.8	70.6	39.4	212	103	42.0
27	74.8	38.8	36.4	162	106	66.6	48.9	54.9	36.4	234	55.8	53.0
28	59.2	35.8	41.4	120	79.0	63.8	51.6	45.5	38.2	248	90.4	146
29	54.9	34.8	*61.5	93.3	63.8	52.4	87.5	---------	55.1	320	119	64.4
30	*56.6	34.2	493	410	54.9	95.9	65.7	---------	305	190	133	49.2
31	55.8	43.4	---------	839	---------	60.0	77.9	---------	130	---------	82.6	---------
Total	3,654.4	2,175.2	2,451.1	4,168.1	6,973.4	6,084.1	2,949.3	2,970.4	2,037.1	4,734.3	4,322.5	2,125.4
Mean												
Mgd	118	70.2	81.7	134	232	196	95.1	106	65.7	158	139	70.8
Cfs	183	109	126	207	359	303	147	164	102	244	215	110
Ac-ft	11,210	6,680	7,520	12,790	21,400	18,670	9,050	9,120	6,250	14,530	13,270	6,520

Calendar Year 1964: Max 1,040 Min 29.1 Mean mgd 125 Mean cfs 193 Ac-ft 140,800
Fiscal Year 1964-65: Max 1,010 Min 33.6 Mean mgd 122 Mean cfs 189 Ac-ft 137,000

* Discharge measurement made on this day.

Peak discharge (base, 2,000 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
9-30	2000	6.18	4,470	6,920	4- 5	1830	5.87	3,670	5,680
12-16	1300	5.43	2,720	4,210	4-13	0330	6.55	5,550	8,590
1- 9	2300	5.64	3,150	4,870	5- 3	1030	7.60	9,650	14,900
3-30	2200	5.36	2,590	4,010					

1300. Nahomalu Stream near Mana

Location.--Lat 22°02'41", long 159°45'17", on left bank 1.1 miles northeast of Mana and 5.3 miles northwest of Kekaha School.

Drainage area.--3.77 sq mi.

Records available.--Fiscal years 1962-63 (annual maximum), July 1963 to June 1965.

Gage.--Water-stage recorder. Datum of gage is 236.8 ft above mean sea level (by stadia survey). May 7, 1962, to June 30, 1963, crest-stage gage at site 155 ft downstream at datum 8.26 ft lower.

Extremes.--Maximum discharge during year, 629 mgd (973 cfs) Dec. 16 (gage height, 5.16 ft), from rating curve extended above 15 mgd on basis of slope-area measurement at gage height 5.13 ft; no flow most of the time.

1961-65: Maximum discharge, that of Dec. 16, 1964; no flow most of the time each year.

Revisions.--Figures of maximum discharge for the fiscal years 1962 and 1964 have been revised to 620 mgd (959 cfs) Apr. 25, 1962 (gage height, 5.13 ft, present site and datum) and 47.1 mgd (72.9 cfs) probably either Aug. 17 or Sept. 18, 1963 (gage height, 2.39 ft, from floodmarks), superseding those published in Surface Water Records of Hawaii and other Pacific Areas for 1964.

Remarks.--Records good except those for periods of no gage-height record and those for Apr. 26 to May 2, which are poor. No diversion above station.

Rating table (gage height, in feet, and discharge, in million gallons a day)

1.06	0	1.6	3.80
1.1	.04	1.7	6.00
1.2	.18	1.8	9.00
1.3	.51	1.9	13.0
1.4	1.15	2.2	31.0
1.5	2.25	2.5	58.0

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0				0	a0.1	0.05	0.17		0	0	0.10
2	0				0	a.1	.03	.14		0	3.01	.08
3	0				0	a.1	0	.12		.01	6.45	.07
4	0				0	*.07	0	.10		0	2.25	.05
5	0				0	.03	7.98	.12		0	2.25	.04
6	0				0	0	*24.5	.11		0	1.15	.01
7	*0				0	0	4.68	.05		0	*.83	0
8	0				0	0	2.72	.02		0	.57	0
9	0				0	0	11.8	0		0	.44	0
10	0				0	0	24.9	0		.15	.28	0
11	0	(*)			0	0	3.80	0		0	.21	0
12	0				0	0	2.72	a.02		0	.17	0
13	0				0	0	5.27	0		5.54	.21	0
14	0				0	.02	2.72	0		.51	5.15	*0
15	0				0	*.22	1.70	0		.28	2.87	0
16	0				0	38.0	1.26	0		.15	1.48	0
17	0		(*)		0	*6.47	1.09	*0		.15	1.02	0
18	0				0	2.03	.77	0		.07	.83	0
19	0			(*)	0	6.00	.51	0		0	*.96	0
20	0				0	3.02	.64	0		0	.96	0
21	0				0	1.81	3.89	0		0	.77	0
22	0				a.1	1.48	1.59	0		0	.57	0
23	0				a.05	5.12	.96	0		0	.44	0
24	.04				a.05	2.87	.64	0	(*)	0	.34	0
25	.05				a.5	1.59	.48	0		0	.28	0
26	.05				a.2	.83	.38	0		.06	.21	0
27	0				a.1	.48	.31	0		0	.18	0
28	0				a.1	.34	.25	0		0	.21	0
29	0				a.1	.21	1.03	---------		0	.18	0
30	0				a.1	.17	.34	---------		0	.17	0
31	0		---------		---------	.11	.25	---------		---------	.14	---------
Total	0.14	0	0	0	1.30	71.17	107.26	0.85	0	6.92	34.58	0.35
Mean												
Mgd	0.005	0	0	0	0.043	2.30	3.46	0.030	0	0.231	1.12	0.012
Cfs	0.008	0	0	0	0.066	3.56	5.35	0.046	0	0.357	1.73	0.019
Ac-ft	0.4	0	0	0	4.0	218	329	2.6	0	21	106	1.1

Calendar Year 1964:	Max	38.0	Min	0	Mean mgd	0.221	Mean cfs	0.342	Ac-ft	248		
Fiscal Year 1964-65:	Max	38.0	Min	0	Mean mgd	0.610	Mean cfs	0.944	Ac-ft	682		

Peak discharge (base, 60 mgd, revised)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
12-16	1200	5.16	629	973	4-13	0400	2.80	94.0	145
1- 6	0200	2.80	94.0	145	5- 3	1400	2.78	91.4	141
1- 9	2300	3.03	128	198					

* Discharge measurement or observation of no flow made on this day.

a No gage-height record.

2000. North Fork Kaukonahua Stream above Right Branch, near Wahiawa

Location.--Lat 21°31'09", long 157°56'53", on left bank 140 ft upstream from Mauka ditch intake and Right Branch, and 4.5 miles northeast of Wahiawa.

Drainage area.--1.38 sq mi.

Records available.--May 1913 to July 1953, April 1960 to June 1965. Monthly discharge only for some periods, published in WSP 1319. Prior to July 1963, published as Left Branch of North Fork Kaukonahua Stream near Wahiawa.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 1,150 ft (from topographic map).

Average discharge.--43 years (1913-24, 1926-53, 1960-65), 10.7 mgd (16.6 cfs).

Extremes.--Maximum discharge during year, 1,840 mgd (2,850 cfs) May 1 (gage height, 8.90 ft), from rating curve extended above 44 mgd on basis of slope-area measurement at gage height 12.46 ft; minimum, 0.28 mgd (0.43 cfs) Apr. 3, 4.
1913-53, 1960-65: Maximum discharge, 3,550 mgd (5,490 cfs) Jan. 1, 1933 (gage height, 11.7 ft, from floodmarks), from rating curve extended above 44 mgd by test on model of station site; maximum gage height, 12.46 ft Apr. 15, 1963; minimum discharge, 0.08 mgd (0.12 cfs) Mar. 2, 13, 1941.

Remarks.--Records good except those for periods of no gage-height record, which are fair. No diversion above station.

Rating table (gage height, in feet, and discharge, in million gallons a day)

1.3	0.19	2.3	9.30
1.4	.32	2.5	15.7
1.5	.51	2.8	31.0
1.6	.81	3.1	53.0
1.7	1.25	3.5	100
1.9	2.65	4.0	185
2.1	5.20	5.0	435

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.94	17.0	2.01	10.5	116	5.33	6.10	2.01	1.01	0.47	106	9.83
2	4.22	7.87	2.09	2.57	112	15.5	6.53	1.87	a4.9	.35	264	3.94
3	3.28	4.08	2.17	4.19	20.7	4.78	6.24	7.32	a8.8	.30	108	*3.22
4	5.68	3.39	3.52	2.17	42.4	3.28	4.22	a360	1.73	.41	42.4	3.66
5	2.95	10.9	2.82	12.4	51.0	2.85	5.56	a28	2.25	79.7	15.0	16.9
6	14.6	7.71	3.03	58.5	17.5	2.65	5.29	9.88	3.85	112	25.0	3.39
7	3.28	3.52	1.80	24.0	34.9	2.49	3.52	6.46	1.66	14.0	17.8	3.52
8	*4.06	42.7	*1.66	8.93	17.3	4.56	3.39	25.6	5.71	5.38	9.30	2.75
9	8.74	6.64	16.0	5.56	44.4	39.6	3.06	6.46	1.54	39.7	7.23	2.57
10	3.80	4.50	2.85	4.08	12.9	35.4	16.6	4.08	1.25	14.0	5.92	2.25
11	2.34	3.80	2.01	6.53	10.8	20.7	3.39	3.52	3.16	5.38	5.20	2.09
12	8.26	17.7	5.04	3.06	48.2	32.5	3.06	3.28	1.42	3.80	4.78	2.17
13	3.52	6.10	2.85	*2.65	40.5	48.1	19.2	2.85	1.05	3.67	4.50	3.17
14	3.80	8.29	8.20	10.6	47.5	17.2	3.80	2.65	1.01	3.17	25.6	4.26
15	8.95	11.9	22.0	10.8	10.2	191	3.06	2.49	.85	2.33	45.2	4.60
16	6.34	18.0	33.0	10.3	8.38	34.6	2.75	2.41	.85	2.09	9.65	5.57
17	3.52	13.9	7.46	22.0	7.23	12.9	2.57	2.25	.77	1.94	9.18	2.41
18	2.65	5.56	5.74	9.89	8.72	8.84	2.41	2.01	*.71	1.66	4.78	2.95
19	13.7	5.38	3.39	18.7	26.4	56.8	2.25	1.94	.62	*1.54	4.22	6.10
20	3.17	4.22	10.9	5.56	12.5	17.8	2.09	1.80	.56	1.48	4.33	2.65
21	25.5	3.80	5.27	17.8	6.46	*16.6	2.75	1.66	.53	1.36	16.3	3.33
22	6.64	3.52	7.25	4.50	6.46	19.0	2.25	1.94	.51	1.20	3.80	9.13
23	74.5	4.26	3.52	5.97	6.79	44.3	a55	1.66	1.22	1.25	3.17	2.65
24	53.5	2.95	7.36	4.22	4.92	10.2	a48	1.66	8.66	1.30	2.85	2.25
25	85.2	2.95	3.52	3.06	4.36	19.6	7.46	1.54	1.25	1.10	2.75	2.09
26	11.6	2.85	2.41	3.17	17.9	9.07	3.52	1.25	.62	1.36	11.7	2.75
27	7.92	4.22	2.17	3.52	6.55	11.1	2.95	1.25	.47	8.41	5.79	6.22
28	6.46	5.77	2.09	6.99	4.22	7.00	2.57	1.05	.45	32.4	5.74	12.0
29	6.64	2.65	2.17	20.2	3.66	5.74	3.66	---------	.43	46.5	20.4	3.17
30	6.64	2.33	12.9	3.52	3.28	12.7	2.33	---------	2.04	41.8	19.5	2.33
31	4.92	2.09	----------	97.3	----------	5.74	2.25	---------	1.15	----------	5.20	----------
Total	400.32	240.55	187.20	403.24	754.13	717.93	237.83	488.89	61.03	430.05	815.29	133.92
Mean												
Mgd	12.9	7.76	6.24	13.0	25.1	23.2	7.67	17.5	1.97	14.3	26.3	4.46
Cfs	20.0	12.0	9.65	20.1	38.8	35.9	11.9	27.1	3.05	22.1	40.7	6.90
Ac-ft	1,230	738	574	1,240	2,310	2,200	730	1,500	187	1,320	2,500	411

Calendar Year 1964:	Max	245	Min	0.86	Mean mgd	14.4	Mean cfs	22.3	Ac-ft	16,200
Fiscal Year 1964-65:	Max	360	Min	0.30	Mean mgd	13.3	Mean cfs	20.6	Ac-ft	14,940

* Discharge measurement made on this day.
a No gage-height record.

Peak discharge (base, 700 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-25	0730	7.65	1,350	2,090	2-4	1930	8.69	1,760	2,720
11-13	2330	5.95	752	1,160	4-6	1130	6.75	1,030	1,590
12-15	1430	8.48	1,670	2,580	5-1	2230	8.90	1,840	2,850
1-23	2300	6.00	770	1,190					

2030. Mauka ditch near Wahiawa

Location.--Lat 21°30'45", long 157°59'20", on left bank 0.7 mile northwest of Ku Tree Reservoir and 2.9 miles east of Wahiawa Post Office.

Records available.--March 1947 to June 1965. Prior to July 1958, published as Kaukonahua ditch near Wahiawa.

Gage.--Water-stage recorder (digital) and Parshall flume. Altitude of gage is 1,140 ft (from topographic map).

Average discharge.--18 years, 3.06 mgd (4.73 cfs).

Extremes.--1947-65: Maximum daily discharge, 10.1 mgd (15.6 cfs) Jan. 27, 1948; no flow at times.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Ditch diverts from North Fork Kaukonahua Stream for domestic use in Wahiawa.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.23	2.48	**0.42	4.81	6.65	5.08	0.73	2.6	2.15	0.95	7.16	0.31
2	.20	1.12	.58	3.48	6.58	5.75	.60	3.0	2.87	.75	6.86	.22
3	.18	.63	.76	3.73	5.56	4.44	.55	5.0	6.36	.62	4.20	1.08
4	.60	.58	1.17	2.84	6.31	4.11	.48	9.0	3.94	.70	1.87	2.42
5	.20	.73	1.11	3.43	6.43	3.94	2.60	4.8	3.53	6.93	.88	3.09
6	.33	.63	1.08	5.70	5.84	3.83	4.87	3.6	5.23	8.67	1.2	2.34
7	.17	.54	.99	5.32	6.38	3.74	4.39	3.0	3.27	6.13	1.0	2.28
8	.19	.94	.94	*4.65	5.99	4.21	4.28	3.4	4.83	4.61	.9	2.16
9	.15	.58	1.53	4.43	6.38	7.12	4.17	3.2	3.18	6.65	.9	2.08
10	.14	.58	1.07	3.99	5.75	6.24	5.71	3.0	2.44	5.71	.8	1.91
11	.14	.58	1.00	4.39	5.48	6.08	4.42	2.8	3.86	4.44	.8	1.77
12	2.2	.83	1.54	3.65	5.93	6.56	4.24	2.6	2.52	4.02	.8	1.80
13	.9	.83	1.40	3.33	5.64	7.76	6.28	2.8	2.04	4.25	.7	2.10
14	.9	.88	1.97	3.48	1.69	5.41	4.65	2.8	1.84	*3.67	.7	2.13
15	2.9	1.53	1.69	5.04	.66	4.33	4.36	2.6	1.60	3.15	2.0	2.42
16	1.0	1.06	2.04	4.43	2.69	2.89	4.15	2.5	1.52	2.90	1.4	2.53
17	.8	1.25	.39	5.09	5.63	1.41	3.96	2.3	1.42	2.75	.54	2.16
18	.7	.68	1.78	4.40	5.71	.99	3.69	2.0	1.32	2.47	.45	2.17
19	3.8	.73	3.12	5.07	6.31	4.57	3.36	2.0	1.26	2.17	.37	2.28
20	.8	.63	4.26	4.54	*6.12	2.63	3.86	1.8	1.17	1.98	.32	2.03
21	4.2	.58	3.36	5.03	5.55	2.52	3.49	1.7	1.16	1.70	*.40	1.96
22	1.2	.54	4.01	4.20	5.45	3.85	4.15	1.8	1.12	1.52	.27	2.62
23	7.0	.58	3.39	4.36	5.94	4.74	6.0	*2.5	1.15	1.48	.32	2.04
24	5.4	.54	3.28	4.04	5.27	1.71	5.2	3.05	4.96	1.63	.24	1.83
25	8.0	.54	3.46	3.66	5.01	1.57	3.0	2.93	2.26	1.26	.21	1.61
26	3.8	.54	2.65	3.69	6.73	1.15	3.0	2.35	1.23	1.45	.62	1.95
27	2.3	.54	2.23	4.04	5.88	1.14	3.5	2.38	1.00	3.31	.40	2.20
28	1.2	.68	2.00	4.04	5.23	1.04	4.2	2.27	.89	5.81	.29	2.98
29	*1.39	.54	2.11	5.15	4.96	.88	3.6	---------	.88	6.43	1.12	2.19
30	1.39	.58	4.34	4.04	4.77	1.09	3.4	---------	1.53	7.10	.84	1.79
31	1.31	.58	---------	5.58	---------	*.81	3.0	---------	2.07	---------	.28	---------
Total	53.72	24.05	59.67	133.63	162.52	111.59	113.89	83.78	74.60	105.21	38.84	60.45
Mean												
Mgd	1.73	0.776	1.99	4.31	5.42	3.70	3.67	2.99	2.41	3.51	1.25	2.02
Cfs	2.68	1.20	3.08	6.67	8.39	5.72	5.68	4.63	3.73	5.43	1.93	3.13
Ac-ft	165	74	183	410	499	342	350	257	229	323	119	186

Calendar Year 1964:	Max	8.0	Min	0.13	Mean mgd	2.10	Mean cfs	3.25	Ac-ft	2,360		
Fiscal Year 1964-65:	Max	9.0	Min	0.14	Mean mgd	2.80	Mean cfs	4.33	Ac-ft	3,140		

* Discharge measurement made on this day.
** Field estimate made on this day.
Note.--No gage-height record July 12-28, Jan. 23 to Feb. 23, May 6-16.

2040. North Fork Kaukonahua Stream near Wahiawa

Location.--Lat 21°30'54", long 157°59'19", on left bank 1.0 mile downstream from Poamoho tunnel inflow and 3.1 miles northeast of Wahiawa Post Office.

Drainage area.--4.86 sq mi.

Records available.--September 1946 to June 1965.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 930 ft (revised, from topographic map).

Average discharge.--18 years (1947-65), 22.0 mgd (34.0 cfs).

Extremes.--Maximum discharge during year, 1,720 mgd (2,660 cfs) Feb. 4 (gage height, 12.28 ft), from rating curve extended above 190 mgd as explained below; minimum, 0.94 mgd (1.45 cfs) Apr. 4.
1946-65: Maximum discharge, 3,010 mgd (4,660 cfs) Apr. 15, 1963 (gage height, 20.95 ft), from rating curve extended above 190 mgd on basis of slope-area measurements at gage heights 8.39 and 15.55 ft; no flow at times in 1953.

Remarks.--Records good. Mauka ditch (see preceding page) diverts 2.6 miles above station for domestic use in Wahiawa. Poamoho tunnel (see p. 58) diverts from Poamoho Stream into North Fork Kaukonahua Stream 1.0 mile above station.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.3	0.53	1.6	37.5
.4	1.06	2.0	74.0
.5	1.80	2.5	148
.7	3.95	3.0	245
1.0	9.10	4.0	424
1.3	20.0	5.0	584

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	6.93	31.7	*3.59	39.8	200	5.25	17.3	4.37	2.16	1.41	156	19.6
2	6.76	22.7	3.35	4.65	264	22.7	14.6	3.83	12.6	1.34	545	9.40
3	6.08	7.70	3.47	4.91	37.2	7.10	16.5	5.95	55.8	1.27	344	7.30
4	9.85	6.42	3.83	3.23	107	4.80	11.5	529	5.40	1.00	137	6.25
5	5.40	25.9	4.51	14.6	125	3.71	12.5	162	3.47	254	59.2	53.6
6	18.3	14.7	4.41	103	40.5	3.35	12.8	26.2	24.1	344	59.6	9.07
7	6.42	7.50	3.11	58.4	84.5	3.11	6.59	16.1	4.65	45.0	43.2	6.76
8	6.25	74.8	2.55	*10.7	42.0	3.23	5.57	51.5	17.6	15.0	23.5	5.74
9	11.4	14.1	18.5	12.3	91.2	101	4.95	31.2	4.23	109	18.3	5.10
10	6.08	8.50	5.10	6.25	31.2	87.2	47.2	7.90	2.55	69.3	14.6	4.51
11	6.81	6.59	3.23	9.63	17.4	34.2	6.59	5.91	3.83	16.1	12.8	4.09
12	15.5	21.8	7.19	4.95	71.6	55.9	5.10	4.95	2.75	10.3	11.5	4.09
13	8.54	11.5	5.10	3.95	36.7	135	64.0	4.37	2.16	15.8	11.8	5.25
14	6.42	14.3	9.50	8.47	122	34.2	8.10	3.71	1.98	10.6	65.1	7.85
15	12.7	25.4	29.2	30.8	21.5	337	5.74	3.35	1.72	*6.59	224	11.5
16	10.5	33.2	110	9.36	16.1	110	4.80	3.23	1.64	5.57	22.0	14.5
17	7.01	59.9	15.5	40.9	10.6	37.5	4.23	2.87	1.56	4.95	22.4	6.08
18	4.37	11.5	10.3	9.60	12.5	24.0	3.83	2.55	1.56	4.51	13.2	6.25
19	16.1	10.3	5.51	28.6	36.6	200	3.47	*2.35	1.56	4.09	11.8	9.38
20	5.40	7.70	15.7	9.78	22.4	54.8	3.23	2.25	1.41	3.83	11.2	5.40
21	50.9	6.93	4.95	31.2	9.70	55.2	4.37	2.16	1.48	3.71	*36.3	4.51
22	10.3	6.59	11.3	7.10	*8.50	73.0	3.71	2.55	1.48	3.59	10.0	17.8
23	146	7.50	7.14	7.66	16.3	159	3.11	2.99	1.41	3.47	8.90	6.27
24	180	5.91	6.57	5.22	7.90	32.3	160	3.11	13.6	3.59	7.90	4.23
25	170	5.74	6.89	4.37	5.74	48.2	35.9	3.35	3.95	3.23	7.10	3.71
26	23.5	5.10	3.11	3.71	50.8	26.7	7.70	2.55	1.64	3.23	20.4	3.95
27	16.6	4.80	2.45	6.78	16.7	32.1	6.59	2.45	1.27	9.68	10.4	5.27
28	12.1	12.3	2.35	6.01	6.42	23.4	5.91	2.25	1.27	71.4	10.6	31.6
29	*9.40	5.91	2.45	38.7	4.95	16.1	9.70	---------	1.27	129	39.2	7.67
30	11.3	4.37	58.1	6.42	4.51	30.9	5.57	---------	1.27	124	39.4	4.23
31	8.10	3.83	----------	236	----------	*15.3	4.95	---------	2.07	----------	10.9	----------
Total	815.02	485.19	368.96	767.05	1521.52	1776.25	506.11	895.00	183.44	1278.56	2007.30	290.96
Mean												
Mgd	26.3	15.7	12.3	24.7	50.7	57.3	16.3	32.0	5.92	42.6	64.8	9.70
Cfs	40.7	24.3	19.0	38.2	78.4	88.7	25.2	49.5	9.16	65.9	100	15.0
Ac-ft	2500	1490	1130	2350	4670	5450	1550	2750	563	3920	6160	893

Calendar Year 1964:	Max	515	Min	1.06	Mean mgd	32.1	Mean cfs	49.7	Ac-ft	36070
Fiscal Year 1964-65:	Max	545	Min	1.00	Mean mgd	29.8	Mean cfs	46.1	Ac-ft	33450

* Discharge measurement made on this day.

2080. South Fork Kaukonahua Stream at East Pump Reservoir, near Wahiawa

Location.--Lat 21°29'32", long 157°59'55", on right bank on upstream side of dam at East Pump Reservoir, 2.3 miles east of Wahiawa Post Office, and 7.1 miles north of Waipahu.

Drainage area.--4.04 sq mi.

Records available.--July 1957 to June 1963, July 1964 to June 1965.

Gage.--Water-stage recorder (digital) and Ogee-type dam control. Datum of gage is 860.35 ft above mean sea level, datum of 1929.

Average discharge.--7 years, 13.5 mgd (20.9 cfs).

Extremes.--Maximum discharge during year, 1,530 mgd (2,370 cfs) Feb. 4 (gage height, 7.19 ft), from rating curve extended above 700 mgd as explained below; minimum, 1.41 mgd (2.18 cfs) Apr. 4, 5.
1957-65: Maximum discharge, 3,530 mgd (5,460 cfs) Apr. 15, 1963 (gage height, 11.33 ft), from rating curve extended above 700 mgd on basis of computation of peak flow over dam; no flow Dec. 24, 25, 27, 28, 1960, Feb. 23, 24, 1963.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Koolau ditch diverts water into Koolau Reservoir (capacity, 43,000,000 gal), and Ku Tree Reservoir (capacity, 293,000,000 gal) located on a tributary.

Rating table (gage height, in feet, and discharge, in million gallons a day)

1.3	0.80	2.2	30.0
1.4	1.60	2.5	61.0
1.5	2.75	3.0	136
1.6	4.25	3.5	235
1.8	8.55	4.0	360
1.9	11.8	5.0	680
2.1	21.4		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	6.90	24	3.4	4.95	140	6.05	7.80	3.26	2.94	2.25	34.2	24.1
2	6.20	9.6	3.6	3.28	125	15.2	7.37	3.03	3.22	1.99	339	8.98
3	4.6	5.5	3.8	4.93	29.4	6.73	11.9	5.36	69.1	1.63	158	6.38
4	7.3	5.0	*4.2	3.12	38.3	5.41	*7.15	374	7.32	1.50	62.9	6.61
5	4.4	16	4.0	6.41	109	4.76	8.68	50	4.59	44.9	31.0	12.1
6	19	9.3	4.0	45.2	43.4	4.43	10.2	22	6.47	145	22.3	6.16
7	4.8	5.0	3.2	28.8	114	4.16	6.34	10	4.56	26.8	22.7	6.45
8	5.6	46	2.8	*5.98	53.7	4.10	5.66	36	3.68	7.74	13.2	5.22
9	11	8.2	2.6	4.95	94.6	23.5	5.21	20	3.17	9.53	11.4	4.62
10	5.3	6.0	6.90	3.96	39.2	58.1	31.8	12	2.82	18.7	8.48	4.24
11	3.7	5.2	4.08	5.59	20.1	29.7	6.98	8.0	9.93	5.79	7.80	3.98
12	10	26	7.31	3.69	42.8	49.1	5.57	6.6	4.89	4.18	7.42	4.40
13	5.0	7.7	5.74	2.94	18.0	79.6	39.9	5.8	3.13	4.37	7.67	5.64
14	5.4	10	8.35	2.70	79.8	15.7	9.16	5.4	2.68	*4.63	43.3	4.36
15	12	17	6.96	15.1	15.6	188	6.23	5.0	2.42	3.31	119	4.18
16	7.8	26	48.7	4.44	12.5	63.0	5.45	4.6	2.29	2.86	20.4	5.50
17	5.0	19	18.7	17.8	10.8	27.6	4.97	4.4	2.19	2.65	27.9	4.05
18	4.0	7.3	8.07	6.10	11.4	15.5	4.62	4.2	2.12	2.50	10.1	3.95
19	19	7.0	4.86	23.3	30.6	118	4.25	*3.90	2.05	2.30	8.57	15.1
20	4.6	5.8	9.57	8.78	*19.3	30.3	3.99	3.75	1.99	2.18	7.61	6.68
21	36	5.3	5.03	39.5	9.72	31.2	4.52	3.51	1.97	2.12	*9.86	6.25
22	8.2	5.0	4.57	8.09	9.88	37.3	4.41	3.72	1.97	2.01	6.95	21.0
23	48	5.9	5.63	8.08	14.9	96.3	3.81	3.72	1.90	2.00	6.27	6.49
24	40	4.4	7.06	5.19	9.18	23.8	38.3	6.86	12.7	2.00	5.56	4.30
25	50	4.2	7.03	4.31	7.04	36.3	33.6	14.1	5.02	1.93	5.21	3.85
26	17	4.0	3.25	3.48	31.0	17.1	5.44	9.57	2.52	2.58	14.6	6.65
27	9.7	5.9	2.81	4.68	18.7	13.5	4.30	3.23	1.98	6.23	17.2	6.10
28	8.0	7.4	2.87	3.54	7.93	12.0	4.31	3.08	1.81	48.5	10.9	14.9
29	8.2	4.1	3.29	18.0	6.67	10.1	6.23	---------	1.72	60.6	14.0	7.67
30	*12	3.8	7.99	4.96	6.00	10.4	4.45	---------	1.78	63.2	24.9	4.32
31	9.0	3.6	---------	52.1	---------	9.32	3.57	---------	2.76	---------	11.7	---------
Total	397.70	319.2	210.37	353.95	1168.52	1046.26	306.17	635.09	177.69	485.98	1090.10	224.23
Mean												
Mgd	12.8	10.3	7.01	11.4	39.0	33.8	9.88	22.7	5.73	16.2	35.2	7.47
Cfs	19.8	15.9	10.8	17.6	60.3	52.3	15.3	35.1	8.87	25.1	54.5	11.6
Ac-ft	1220	980	646	1090	3590	3210	940	1950	545	1490	3350	688

Calendar Year 1964:	Max	-	Min	-	Mean mgd	-	Mean cfs	-	Ac-ft	-
Fiscal Year 1964-65:	Max	374	Min	1.50	Mean mgd	17.6	Mean cfs	27.2	Ac-ft	19,700

* Discharge measurement made on this day.
Note.--No gage-height record July 3 to Sept. 9, Feb. 5-18.

Peak discharge (base, 450 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
11-5	1800	4.37	469	725	2-4	0800	7.19	1,530	2,370
12-15	0430	5.78	962	1,490	4-6	1500	4.83	620	959
12-19	1200	4.46	497	769	5-2	1700	6.98	1,440	2,230

2085. Right Branch of South Fork Kaukonahua Stream near Wahiawa

Location.--Lat 21°29'58", long 157°59'07", on left bank 500 ft downstream from Ku Tree Reservoir spillway, 1 mile upstream from mouth, and 3.1 miles east of Wahiawa Post Office.

Drainage area.--0.86 sq mi.

Records available.--August 1957 to June 1965.

Gage.--Water-stage recorder and masonry control. Altitude of gage is 980 ft (from topographic map).

Average discharge.--7 years (1958-65), 0.820 mgd (1.27 cfs).

Extremes.--Maximum discharge during year, 213 mgd (330 cfs) Dec. 19 (gage height, 4.39 ft); no flow for several days.
1957-65: Maximum discharge, 880 mgd (1,360 cfs) Apr. 15, 1963 (gage height, 6.00 ft), from rating curve extended above 110 mgd; no flow at times.

Remarks.--Records fair. Diversion from South Fork Kaukonahua Stream into Ku Tree Reservoir, above station, then to Schofield Barracks for domestic use.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.03	0	0.9	2.00
.1	.02	1.2	3.90
.2	.07	1.6	8.10
.3	.16	2.1	17.0
.4	.31	2.5	28.0
.5	.51	3.0	50.0
.7	1.08		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.03	0.26	**0.01	0.01	0.10	0.07	0.26	0.07	0.03	0.05	0.92	0.14
2	.01	.05	.01	.01	.12	.08	.23	.06	.04	.04	1.00	.13
3	.01	.02	.01	0	.02	.06	.15	.06	.04	.01	.31	.14
4	.04	.01	.02	0	.08	.07	.11	28.2	.05	.01	.06	.13
5	.03	.02	.03	0	.54	.08	.21	17.7	.05	.24	.05	.14
6	.04	.02	.01	0	.05	.10	1.93	1.55	.05	.90	.03	.11
7	.20	.02	.02	0	.50	.10	*.32	.58	.05	.04	.02	.10
8	.11	.02	.02	.01	.58	.10	.14	.46	.04	.01	.02	.10
9	.03	.02	.04	**.01	.56	.06	.10	.46	.04	.01	.02	.08
10	.02	.03	.04	0	.02	.12	4.65	.12	.04	.01	.02	.06
11	.02	.03	.12	0	.01	.03	.34	.09	.05	.01	.03	.06
12	.02	.03	.17	0	.01	.10	.20	.09	.04	.01	.02	.05
13	.02	.15	.29	.01	.01	.23	8.22	.09	.05	.06	.03	.05
14	.03	.11	.12	.01	.01	.07	.84	.09	.04	.02	.60	.05
15	.06	.16	.03	.02	.01	.33	.26	.09	.05	.01	9.85	.05
16	.02	.05	.12	.01	.01	4.00	.14	.09	.05	0	1.16	.05
17	.01	.12	.02	0	.01	3.29	.10	.08	.05	0	.29	.06
18	.01	.06	.01	0	.01	.42	.09	.06	.06	0	.12	.06
19	.01	.04	.01	0	.01	31.7	.09	*.05	.06	0	.23	.06
20	.01	.03	.01	.01	*.02	8.61	.09	.04	.05	0	.31	.04
21	.10	.02	.01	.01	.01	6.59	.10	.04	.05	.01	.34	.05
22	.02	.02	.01	.01	.02	12.8	.10	.04	.05	.01	.26	.10
23	.10	.06	.01	.02	.31	19.5	.09	.04	.06	.01	.29	.05
24	.08	.02	.01	.01	.04	3.86	.16	.04	.07	.01	.19	.04
25	.07	.01	.01	.01	.03	2.85	.10	.04	.06	.01	.20	.04
26	.01	.02	.01	.01	.44	1.50	.09	.04	.05	.01	.40	.04
27	.01	.02	.02	.01	.08	1.08	.08	.04	.05	.02	.44	.05
28	.01	.02	.02	.01	.08	.95	.08	.03	.06	.02	*.13	.08
29	.01	.02	.02	.05	.07	.56	.18	---------	.06	.08	.16	.03
30	**.01	.01	.02	.02	.08	.51	.08	---------	.06	.19	1.37	.05
31	.01	.01	---------	.02	---------	.40	.08	---------	.05	---------	.23	---------
Total	1.16	1.48	1.25	0.28	3.84	100.22	19.61	50.34	1.55	1.80	19.10	2.19
Mean												
Mgd	0.037	0.048	0.042	0.009	0.128	3.23	0.633	1.80	0.050	0.060	0.616	0.073
Cfs	0.057	0.074	0.065	0.014	0.198	5.00	0.979	2.79	0.077	0.093	0.953	0.113
Ac-ft	3.6	4.5	3.8	0.9	12	308	60	154	4.8	5.5	59	6.7

Calendar Year 1964: Max 31.7 Min 0 Mean mgd 0.322 Mean cfs 0.498 Ac-ft 362
Fiscal Year 1964-65: Max 31.7 Min 0 Mean mgd 0.556 Mean cfs 0.860 Ac-ft 623

Peak discharge (base, 200 mgd)

Date	Time	Gage height	Discharge	
			Mgd	Cfs
12-19	1130	4.39	213	330

* Discharge measurement made on this day.
** Field estimate made on this day.

2109. Poamoho tunnel near Wahiawa

Location.--Lat 21°31'12", long 157°58'51", on left bank 5 ft downstream from tunnel outlet and 3.6 miles northeast of Wahiawa Post Office.

Records available.--July 1958 to June 1965.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 1,120 ft (from topographic map).

Average discharge.--7 years, 3.25 mgd (5.03 cfs).

Extremes.--1958-65: Maximum daily discharge, 128 mgd (198 cfs) Apr. 15, 1963; no flow at times.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Tunnel diverts from Poamoho Stream to North Fork Kaukonahua Stream to augment storage in Wahiawa Reservoir.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.01	0.01	0.01	7.82	8.98	0.01	0.01	0.01	0.80	0.35	18.8	0.01
2	.01	.01	.01	.01	25.0	.01	.01	.01	2.74	.35	74.0	.01
3	.01	.01	.01	.01	.01	.01	.01	.01	9.14	.30	60.7	.01
4	.01	.01	**.01	.41	4.67	.01	.01	38.6	.96	a.2	27.6	.01
5	.01	2.88	.01	1.06	12.8	.01	.01	18.4	1.55	a.5	15.1	2.46
6	.01	.01	.01	*2.80	.17	.01	.01	.01	14.6	a24	11.1	.01
7	.01	.01	.01	2.66	5.95	.01	.01	.01	1.36	*a15	3.76	.01
8	.01	3.67	.01	.72	.01	.01	.01	1.76	6.68	3.90	.01	.01
9	.01	.01	.01	.80	4.40	10.1	.01	3.00	1.00	20.6	.01	.01
10	.01	.01	.01	.76	.02	8.25	4.28	.01	.80	15.0	.01	.01
11	.01	.01	.01	.76	.01	.11	.01	.01	1.75	3.80	.01	.01
12	.02	.01	.01	.72	*.01	.32	.01	.01	.76	2.75	.01	.01
13	.02	.01	.01	.72	.97	9.21	6.23	.01	.64	6.56	.01	.01
14	.01	.01	.01	.68	2.92	1.04	.01	.01	.56	3.30	3.02	.01
15	.01	.01	.28	.80	.02	35.0	.01	**.01	.47	2.02	25.5	.01
16	.01	1.37	11.9	.72	.01	1.47	.01	.01	.47	1.74	.01	.01
17	.01	13.7	.01	.76	.02	.01	.01	.01	.44	1.60	**.01	.01
18	.01	.01	.01	.72	.02	.01	.01	.01	.42	1.42	.01	.01
19	.01	.01	.01	.72	.34	a2.5	.01	.01	.42	1.24	.01	.01
20	.01	.01	.17	.64	.01	.55	.01	.01	.40	1.18	.01	.01
21	4.40	.01	.01	.98	.01	1.86	.01	.01	.37	1.00	.01	.01
22	.04	.01	.01	.68	.01	4.98	.01	.43	.37	.96	.01	.01
23	12.6	.01	.01	.64	.01	a3.2	.01	.92	.59	.92	.01	.01
24	25.6	.01	.01	.60	.01	.01	6.09	.94	4.15	1.06	.01	.01
25	13.1	.01	.01	.56	.01	.03	1.01	.96	.84	.88	.01	.01
26	.01	.01	.01	.56	6.34	.03	.01	.80	.44	.80	.01	.01
27	.01	.01	.01	.64	.01	.02	.01	.76	.35	2.39	.01	.01
28	.01	.01	.01	.53	.01	.01	.01	.80	.30	18.5	.01	.06
29	.01	.01	.01	1.43	.01	**.01	.01	---------	.30	27.4	.01	.01
30	.01	.01	22.6	.53	.01	.01	.01	---------	.28	17.5	.01	.01
31	.01	.01	---------	34.7	---------	.01	.01	---------	.37	---------	.01	---------
Total	56.02	21.89	35.21	66.14	72.77	78.82	17.88	67.54	54.32	177.22	239.80	2.80
Mean												
Mgd	1.81	0.706	1.17	2.13	2.43	2.54	0.577	2.41	1.75	5.91	7.74	0.093
Cfs	2.80	1.09	1.81	3.30	3.76	3.93	0.893	3.73	2.71	9.14	12.0	0.144
Ac-ft	172	67	108	203	223	242	55	207	167	544	736	8.6

Calendar Year 1964:	Max	65.6	Min	0.01	Mean mgd	2.35	Mean cfs	3.64	Ac-ft	2640		
Fiscal Year 1964-65:	Max	74.0	Min	0.01	Mean mgd	2.44	Mean cfs	3.78	Ac-ft	2730		

* Discharge measurement made on this day.
** Field estimate made on this day.
a No gage-height record.

2110. Poamoho Stream near Wahiawa

Location.--Lat 21°31'24", long 157°58'55", on left bank 180 ft downstream from Poamoho tunnel intake and 3.7 miles northeast of Wahiawa Post Office.

Drainage area.--1.79 sq mi.

Records available.--January 1947 to June 1965.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 1,150 ft (from topographic map).

Average discharge.--18 years, 2.63 mgd (4.07 cfs).

Extremes.--Maximum discharge during year, 1,190 mgd (1,840 cfs) May 1 (gage height, 7.01 ft), from rating curve extended above 49 mgd as explained below; minimum, 0.08 mgd (0.12 cfs) Apr. 26, 27, May 1.

1947-65: Maximum discharge, 1,440 mgd (2,230 cfs) Apr. 15, 1963 (gage height, 8.24 ft), from rating curve extended above 49 mgd by test on model of station site; no flow at times.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Poamoho tunnel (see preceding page) diverts 180 ft above station to North Fork Kaukonahua Stream to augment storage in Wahiawa Reservoir.

Rating table (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used May 15-19)

0.1	0.04	0.8	5.75
.2	.19	1.0	10.0
.3	.47	1.2	16.2
.4	.99	1.5	31.5
.5	1.77	2.0	74.0
.6	2.83	2.5	140

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.18	3.45	0.74	10.6	24.4	1.85	6.82	1.50	0.17	0.23	44.4	4.05
2	1.11	3.17	.64	2.46	25.0	4.32	5.91	1.41	.32	.21	1.25	2.25
3	1.04	1.33	.64	2.05	7.70	2.25	5.93	1.77	1.18	.19	79.3	1.85
4	.92	1.11	*1.2	1.3	20.3	1.60	3.55	69.9	.74	.15	10.5	1.77
5	.79	6.04	1.1	.8	16.8	1.41	4.40	24.3	.69	26.4	.76	8.90
6	.99	2.46	1.0	*16.4	10.3	1.33	6.20	8.05	.92	28.8	.28	2.46
7	.99	1.33	1.0	13.2	19.9	1.25	3.05	5.55	.59	*.19	7.69	1.97
8	.85	9.19	1.0	1.97	12.2	2.93	2.72	14.7	.69	.19	13.7	1.68
9	2.40	2.46	2.5	1.18	14.5	19.4	2.46	9.55	.59	.40	4.73	1.60
10	1.25	1.68	1.8	.85	7.65	14.7	10.8	4.15	.47	.21	4.26	1.33
11	.85	1.55	1.2	1.93	4.90	11.3	2.96	3.55	.55	.17	3.70	1.25
12	3.33	2.83	1.4	.59	*7.00	13.5	2.46	3.30	.43	.17	3.85	1.33
13	2.27	2.83	1.4	.36	14.1	22.4	13.1	2.96	.39	.17	3.97	1.50
14	.99	2.72	1.2	.30	12.2	13.5	3.30	2.72	.36	.15	34.6	1.97
15	1.77	5.02	1.4	6.64	4.26	50.1	2.60	*2.60	.30	.13	40.4	6.38
16	2.30	6.62	10	2.2	3.55	20.5	2.25	2.60	.30	.11	7.22	3.81
17	1.65	10.7	2.8	8.0	3.05	10.3	1.97	2.25	.30	.11	*5.55	1.85
18	.79	3.05	2.0	5.5	3.45	6.53	1.85	1.97	.30	.11	4.26	1.41
19	3.23	2.25	1.3	4.3	8.27	34.7	1.68	1.68	.28	.11	*2.22	2.25
20	1.25	1.68	5.8	2.05	5.94	13.2	1.50	1.60	.28	.10	4.42	1.41
21	8.97	1.41	1.8	9.82	3.30	18.2	2.72	1.50	.25	.10	7.92	1.33
22	3.05	1.41	2.8	1.77	2.83	26.1	1.77	1.11	.25	.11	3.19	5.48
23	15.2	1.41	2.5	1.77	5.97	28.2	1.50	.55	.25	.10	2.83	1.85
24	18	1.11	1.8	.99	2.96	10.5	15.7	.59	.39	.10	2.46	1.25
25	10	1.41	2.3	.74	2.05	14.8	7.83	.76	.30	.10	2.25	1.18
26	7.5	1.11	1.8	1.52	11.1	10.5	2.35	.28	.28	.08	3.58	1.11
27	*3.19	1.37	1.5	5.15	4.81	12.0	1.97	.25	.25	.08	2.96	1.41
28	2.25	2.82	1.2	1.18	2.35	7.22	1.85	.23	.23	.67	2.46	9.15
29	2.0	1.33	1.0	9.55	1.85	*5.32	4.63	---------	.23	7.76	6.02	1.97
30	2.8	.85	4.2	1.41	1.77	7.96	1.85	---------	.23	1.05	7.54	1.33
31	1.7	.74	---------	27.0	---------	4.90	1.77	---------	.25	---------	2.46	---------
Total	104.61	86.44	61.02	143.58	264.46	392.77	129.45	171.38	12.76	68.45	444.48	77.08
Mean												
Mgd	3.37	2.79	2.03	4.63	8.82	12.7	4.18	6.12	0.412	2.28	14.3	2.57
Cfs	5.21	4.32	3.14	7.16	13.6	19.6	6.47	9.47	0.637	3.53	22.1	3.98
Ac-ft	321	265	187	441	812	1,210	397	526	39	210	1,360	237

Calendar Year 1964:	Max	50.1	Min	0.02	Mean mgd	4.03	Mean cfs	6.24	Ac-ft	4,530		
Fiscal Year 1964-65:	Max	125	Min	0.08	Mean mgd	5.36	Mean cfs	8.29	Ac-ft	6,000		

* Discharge measurement made on this day.

Note.--No gage-height record July 24-26, 29-31, Sept. 4-30, Oct. 4, 5, 16-19.

2113. Makaleha Stream near Waialua

Location.--Lat 21°33'49", long 158°09'21", on left bank 1.0 mile southeast of Dillingham Ranch and 1.9 miles southwest of sugar mill at Waialua.

Drainage area.--4.20 sq mi.

Records available.--Fiscal years 1958-64 (annual maximum), February to December 1964. Discontinued as a continuous-record station; converted to a crest-stage partial-record station.

Gage.--Water-stage recorder. Altitude of gage is 160 ft (from topographic map). Oct. 25, 1957, to Oct. 16, 1963, crest-stage gage at site 1,100 ft downstream and Oct. 17, 1963, to Jan. 31, 1964, crest-stage gage at site 500 ft upstream, both at different datums.

Extremes.--Maximum discharge during period July to December, 1,670 mgd (2,580 cfs) Dec. 23 (gage height, 7.01 ft, from floodmarks), from rating curve extended above 7.7 mgd on basis of slope-area measurement of peak flow; no flow most of the time.
1957-64: Maximum discharge, that of Dec. 23, 1964; no flow most of the time each year.

Remarks.--Records excellent except those for periods of flow and those for period of no gage-height record, which are poor. No diversion above station.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.39	0	1.1	1.75
.5	.02	1.2	2.90
.6	.06	1.3	4.60
.7	.14	1.5	10.0
.8	.30	1.8	21.0
.9	.57	2.3	49.0
1.0	1.05	2.8	95.0

Discharge, in million gallons a day, July to December 1964

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0			0	0	0						
2	0			0	0	0						
3	0			0	0	0						
4	0			0	0	0						
5	0			0	0	0						
6	0			0	0	0						
7	0			0	0	0						
8	0			0	5.57	0						
9	0			*0	.22	0						
10	0			0	0	7.11						
11	0			0	0	*1.56						
12	0			0	0	4.7						
13	0			0	0	2.0						
14	0			0	0	1.0						
15	0			0	0	2.3						
16	0			0	0	30						
17	0			0	0	*8.0						
18	0			6.17	0	3.5						
19	0			1.98	0	30						
20	0			.47	0	6.0						
21	0			.26	0	4.5						
22	0			0	0	3.5						
23	1.47			0	5.88	*7.0						
24	1.10			0	3.21	90						
25	3.61			0	1.94	10						
26	0			0	0	4.0						
27	0			0	0	2.5						
28	*0			0	0	.7						
29	0			0	0	.2						
30	0			0	0	0		---				
31	0	(*)	---	0	---	0		---		---		---
Total	6.18	0	0	8.88	16.82	218.57						
Mean												
Mgd	0.199	0	0	0.286	0.561	7.05						
Cfs	0.308	0	0	0.443	0.868	10.9						
Ac-ft	19	0	0	27	52	671						

Calendar Year 1964:	Max	-	Min	-	Mean mgd	-	Mean cfs	-	Ac-ft	-		
Fiscal Year 1964-65:	Max	-	Min	-	Mean mgd	-	Mean cfs	-	Ac-ft	-		

* Discharge measurement or observation of no flow made on this day.
Note.--No gage-height record Dec. 12-31.

2116. Makaha Stream near Makaha

Location.--Lat 21°30'16", long 158°10'59", on right bank 1.5 miles northeast of Kaneaki Heiau and 3.4 miles northeast of Makaha.

Drainage area.--2.31 sq mi.

Records available.--July 1959 to June 1965.

Gage.--Water-stage recorder and concrete-masonry control. Datum of gage is 938.64 ft above mean sea level (Waianae Plantation bench mark).

Average discharge.--6 years, 1.31 mgd (2.03 cfs).

Extremes.--Maximum discharge during year, 624 mgd (965 cfs) Dec. 23 (gage height, 5.91 ft), from rating curve extended above 33 mgd as explained below; minimum, 0.01 mgd (0.02 cfs) for several days in September and October.

1959-65: Maximum discharge, 756 mgd (1,170 cfs) Mar. 13, 1962 (gage height, 6.50 ft, from floodmark), from rating curve extended above 33 mgd on basis of slope-area measurement of peak flow; no flow at times.

Remarks.--Records good. No diversion above station. Continuous records of rainfall are obtained at station.

Rating tables (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used Dec. 23-30, Feb. 4-17)

July 1 to Dec. 22

1.04	0	1.5	1.54
1.1	.02	1.6	2.58
1.2	.11	1.7	4.00
1.3	.35	1.9	8.20
1.4	.80		

Note.--Same as following table above 1.9 ft.

Dec. 23 to June 30

1.2	0.15	2.0	11.3
1.3	.49	2.3	24.4
1.4	1.05	2.6	44.5
1.5	1.87	3.0	85.0
1.7	4.15	3.5	155
1.9	8.20		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.06	0.11	0.02	0.02	0.50	0.46	1.42	2.46	0.64	0.92	1.26	0.99
2	.07	.08	.01	*.02	.65	.46	1.19	2.05	.59	.92	1.19	.92
3	.08	.07	.01	.01	.24	.35	1.12	2.15	.54	2.95	1.42	.80
4	.08	.07	.01	.01	.16	.32	1.05	8.14	.54	2.90	1.19	.74
5	.07	.07	.02	.02	.26	.29	1.05	8.01	.54	8.49	1.70	.69
6	.06	.07	.01	.11	.50	.24	1.87	6.85	.54	8.24	1.34	.64
7	.05	.06	.01	.38	.90	.18	1.34	7.30	.49	3.15	8.04	.64
8	.06	.14	.01	.14	1.43	.16	1.12	4.87	.45	2.24	4.28	.64
9	.07	.24	.01	.09	.65	.40	.92	3.77	.41	1.42	2.79	.59
10	.06	.12	.01	.07	*.50	5.96	18.6	3.15	12.1	1.68	2.15	.54
11	.05	.08	.01	.05	.29	3.50	5.41	1.58	4.51	1.50	2.90	.54
12	.04	.06	.01	.03	.18	6.51	4.51	1.26	3.65	*1.27	2.10	.49
13	.03	.06	.01	.02	.16	4.22	12.0	.92	3.65	1.67	2.05	.45
14	.03	.04	.01	.02	.16	2.22	7.30	.59	3.27	1.50	14.8	.49
15	.04	.06	.01	.02	.14	3.01	5.59	.49	2.05	1.12	21.8	.49
16	.14	.06	.01	.02	.11	40.5	3.27	1.79	1.58	.99	5.77	.49
17	.24	.11	.02	.02	.09	10.3	4.20	*1.26	1.42	.99	3.70	.49
18	.12	.08	.07	4.74	.08	4.00	2.68	1.19	1.34	.99	*2.50	.45
19	.08	.06	.06	2.94	1.21	39.0	2.35	1.05	1.26	.86	6.75	.41
20	.06	.05	.05	.75	.60	8.51	1.96	.99	1.12	.80	3.40	.37
21	.44	.03	.04	.35	.92	6.18	14.2	.92	1.19	.74	2.68	.37
22	.70	.03	.17	.26	.75	5.36	7.75	.99	1.12	.74	2.25	.37
23	3.93	.02	.07	.26	6.88	129	3.77	1.05	1.42	.69	1.87	.33
24	*3.04	.02	.04	.18	2.10	*15.5	2.90	1.34	2.68	.69	1.50	.33
25	5.77	.02	.04	.14	1.20	4.87	2.68	1.34	1.42	1.10	1.34	.37
26	1.20	.02	.03	.24	1.72	3.15	2.25	.86	1.19	1.19	1.19	.33
27	.55	.02	.03	.18	2.07	1.78	1.96	.74	.99	1.71	1.12	.29
28	.35	.02	.03	.12	1.36	1.05	1.68	.69	.99	2.88	1.12	.29
29	.24	.03	.02	.11	.80	.64	9.35	---------	1.05	2.55	.99	.29
30	.16	.03	.02	.09	.55	*1.06	3.52	---------	.99	1.58	.99	.29
31	.12	.02	---------	.21	---------	1.50	3.15	---------	.92	---------	.92	---------
Total	17.99	1.95	0.87	11.62	27.16	300.68	132.16	67.80	54.65	58.47	107.10	15.12
Mean												
Mgd	0.580	0.063	0.029	0.375	0.905	9.70	4.26	2.42	1.76	1.95	3.45	0.504
Cfs	0.897	0.098	0.045	0.580	1.40	15.0	6.59	3.74	2.72	3.02	5.34	0.780
Ac-ft	55	6.0	2.7	36	83	923	406	208	168	179	329	46

Calendar Year 1964:	Max	129	Min	0.01	Mean mgd	1.36	Mean cfs	2.10	Ac-ft	1.520
Fiscal Year 1964-65:	Max	129	Min	0.01	Mean mgd	2.18	Mean cfs	3.37	Ac-ft	2.440

* Discharge measurement made on this day.

Peak discharge (base, 100 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-25	1500	3.30	125	193	1-10	0300	4.27	284	439
12-16	1700	5.24	480	743	3-10	1530	3.83	204	316
12-19	1000	5.13	457	707	5- 7	1530	3.69	184	285
12-23	0700	5.91	624	965					

2118. Kaupuni Stream at altitude 374 ft, near Waianae

Location.--Lat 21°28'20", long 158°09'26", on right bank at diversion dam, 2.6 miles northeast of Waianae Cemetery, and 2.8 miles northeast of junction of Waianae Valley Road and Farrington Highway.

Drainage area.--3.27 sq mi.

Records available.--May 1960 to June 1965. Prior to July 1962, published as "at altitude 360 ft, near Waianae."

Gage.--Water-stage recorder (digital since July 23) and concrete-masonry control. Datum of gage is 374 ft above mean sea level (by stadia survey).

Average discharge.--5 years, 0.532 mgd (0.823 cfs).

Extremes.--Maximum discharge during year, 865 mgd (1,340 cfs) Dec. 23 (gage height, 4.75 ft), from rating curve extended above 98 mgd on basis of slope-area measurement at gage height 4.06 ft; no flow for many days.
1960-65: Maximum discharge, that of Dec. 23, 1964; no flow at times each year.

Remarks.--Records good. Several water-development tunnels above station may affect flow.

Rating table (gage height, in feet, and discharge, in million gallons a day)

1.06	0	1.8	5.15
1.1	.02	1.9	7.40
1.2	.10	2.1	14.0
1.3	.28	2.3	24.5
1.4	.64	2.6	53.0
1.5	1.25	3.0	110
1.6	2.10	3.5	230
1.7	3.50		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0				0	0	0.59	0.64	0.24	0.11	0.24	0.43
2	0				0	0	.56	.59	.24	.11	.26	.40
3	0		(*)	(*)	0	0	.55	.59	.22	.11	.26	.39
4	0				0	0	.55	.75	.22	.11	.27	.37
5	0				0	0	.54	.90	.22	.47	.29	.37
6	0				0	0	.51	1.47	.22	1.51	.27	.35
7	0				0	0	.51	2.60	.22	.24	.33	.33
8	0				0	0	.51	1.03	.22	*.15	.34	.33
9	0				0	0	.51	.80	.22	.13	.34	.31
10	0				*0	0	11.6	.75	7.17	.13	.33	.30
11	0				0	0	1.17	.69	.79	.14	.34	.29
12	0				0	0	.75	.64	.24	.16	.33	.30
13	0				0	0	3.35	.64	.19	.18	.31	.27
14	0				0	0	1.55	.59	.18	.19	3.58	.20
15	0				0	0	1.03	.51	.19	.19	14.1	.20
16	0				0	8.31	.85	.47	.19	.18	3.19	.19
17	0				0	1.60	.85	*.43	.19	.20	1.79	.19
18	0				0	.03	.80	.39	.18	.19	1.42	.19
19	0				0	44.0	.75	.36	.18	.19	2.65	.19
20	0				0	8.33	.75	.36	.17	.19	*1.97	.19
21	0				0	*1.71	3.05	.30	.16	.19	1.47	.19
22	0				0	.96	1.40	.28	.15	.19	1.24	.18
23	*0				*.38	*140	.85	.28	.14	.19	1.09	.18
24	0				0	10.3	.80	.28	.13	.19	.94	.18
25	2.01				0	3.18	.75	.28	.13	.20	.81	.18
26	.05				0	1.50	.75	.26	.13	.20	.71	.17
27	.01				0	.90	.69	.24	.12	.20	.66	.16
28	0				0	.73	.64	.24	.12	.20	.59	.17
29	0				0	.66	.80	---------	.11	.21	.53	.16
30	0				0	.62	.64	---------	.11	.22	.50	.17
31	0		----------		----------	.59	.64	---------	.11	----------	.46	----------
Total	2.07	0	0	0	0.38	223.42	39.29	17.36	13.10	6.87	41.61	7.53
Mean												
Mgd	0.067	0	0	0	0.013	7.21	1.27	0.620	0.423	0.229	1.34	0.251
Cfs	0.104	0	0	0	0.020	11.2	1.96	0.959	0.654	0.354	2.07	0.388
Ac-ft	6.4	0	0	0	1.2	686	121	53	40	21	128	23

Calendar Year 1964: Max 140 Min 0 Mean mgd 0.698 Mean cfs 1.08 Ac-ft 784
Fiscal Year 1964-65: Max 140 Min 0 Mean mgd 0.865 Mean cfs 1.34 Ac-ft 1.080

* Discharge measurement or observation of no flow made on this day.

Peak discharge (base, 160 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
12-19	1030	4.32	586	907	12-23	0700	4.75	865	1,340

2118.5 Puea mauka ditch near Waianae

Location.--Lat 21°28'12", long 158°09'43", on left bank 2.3 miles northeast of Waianae School and 2.8 miles north of Lualualei Naval Radio Station.

Records available.--June 1960 to June 1965.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 360 ft (from topographic map).

Average discharge.--5 years, 0.329 mgd (0.509 cfs).

Extremes.--1960-65: Maximum daily discharge, 1.4 mgd (2.2 cfs) Oct. 22, 1960; minimum daily, 0.11 mgd (0.17 cfs) Aug. 21, 1961.

Remarks.--Records good. Water is used for irrigation of truck farms in Waianae Valley. Continuous records of rainfall are obtained at station.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.32	0.39	0.29	0.20	0.23	0.26	0.36	0.32	0.20	0.26	0.32	0.39
2	.32	.32	.32	.20	.26	.26	.32	.26	.20	.20	.39	.36
3	.32	.23	*.26	*.26	.29	.32	.32	.36	.29	.23	.43	.36
4	.29	.32	.26	.20	.32	.32	.26	.29	.23	.20	.32	.36
5	.32	.29	.23	.20	.32	.36	.32	.23	.36	.23	.32	.36
6	.32	.36	.26	.23	.26	.32	.23	.23	.43	.29	.32	.36
7	.32	.36	.23	.20	.36	.36	.23	.26	.39	.23	.29	.36
8	.32	.47	.26	.23	.20	.36	.18	.29	.39	*.32	.29	.39
9	.32	.32	.29	.23	.20	.32	.26	.36	.32	.36	.29	.39
10	.26	.32	.23	.29	*.19	.32	.32	.29	.26	.32	.23	.39
11	.32	.32	.23	.26	.20	.23	.20	.32	.20	.26	.23	.39
12	.32	.29	.23	.23	.29	.26	.23	.29	.20	.23	.23	.36
13	.26	.23	.23	.26	.32	.18	.23	.32	.32	.32	.23	.36
14	.18	.23	.20	.23	.32	.18	.20	.32	.32	.32	.36	.36
15	.29	.39	.20	.29	.29	.23	.20	.26	.20	.26	.32	.36
16	.26	.36	.20	.26	.26	.26	.18	.26	.26	.32	.26	.36
17	.32	.32	.23	.29	.26	.20	.23	.20	.23	.43	.29	.36
18	.32	.29	.18	.26	.26	.20	.20	.26	.26	.32	.29	.36
19	.18	.29	.23	.18	.18	.37	.18	.26	.23	.32	.32	.36
20	.20	.26	.29	.20	.23	.20	.20	.26	.29	.36	*.32	.36
21	.20	.39	.20	.26	.39	*.19	.26	.29	.36	.43	.29	.39
22	.20	.47	.23	.18	.36	.23	.23	.23	.26	.43	.26	.36
23	*.27	.47	.20	.20	.32	.59	.20	.29	.23	.39	.29	.36
24	.23	.39	.20	.26	.20	.13	.18	.29	.20	.51	.26	.43
25	.29	.32	.18	.26	.20	.15	.20	.26	.26	.43	.32	.39
26	.32	.39	.23	.26	.23	.13	.32	.20	.29	.39	.29	.32
27	.32	.36	.20	.23	.15	.13	.26	.23	.32	.32	.32	.32
28	.36	.36	.18	.23	.20	.15	.26	.23	.29	.36	.32	.29
29	.36	.39	.18	.29	.23	.26	.26	---------	.20	.29	.39	.23
30	.36	.36	.15	.32	.23	.29	.32	---------	.23	.26	.39	.29
31	.36	.36	---------	.32	---------	.29	.36	---------	.18	---------	.32	---------
Total	9.03	10.62	6.80	7.51	7.75	8.05	7.70	7.66	8.40	9.59	9.50	10.73
Mean												
Mgd	0.291	0.343	0.227	0.242	0.258	0.260	0.248	0.274	0.271	0.320	0.306	0.358
Cfs	0.450	0.531	0.351	0.374	0.399	0.402	0.384	0.424	0.419	0.495	0.473	0.554
Ac-ft	28	33	21	23	24	25	24	24	26	29	29	33

Calendar Year 1964:	Max	0.67	Min	0.13	Mean mgd	0.315	Mean cfs	0.487	Ac-ft	356		
Fiscal Year 1964-65:	Max	0.59	Min	0.13	Mean mgd	0.283	Mean cfs	0.438	Ac-ft	319		

* Discharge measurement made on this day.

2128. Kipapa Stream near Wahiawa

Location.--Lat 21°28'15", long 157°57'50", on left bank 1,700 ft downstream from forest-reserve boundary, 4.9 miles southeast of Wahiawa Post Office, and 6.3 miles northeast of Waipahu.

Drainage area.--4.29 sq mi.

Records available.--January 1957 to June 1965.

Gage.--Water-stage recorder. Altitude of gage is 690 ft (from topographic map).

Average discharge.--8 years, 6.56 mgd (10.1 cfs).

Extremes.--Maximum discharge during year, 1,920 mgd (2,970 cfs) May 2 (gage height, 10.18 ft), from rating curve extended above 190 mgd as explained below; minimum, 0.16 mgd (0.25 cfs) Sept. 8, 9.
1957-65: Maximum discharge, 3,670 mgd (5,680 cfs) May 14, 1963 (gage height, 12.29 ft), from rating curve extended above 190 mgd on basis of slope-area measurements at gage heights 7.96 and 12.29 ft; no flow at times.

Remarks.--Records good. Continuous records of rainfall are obtained at station.

Rating table (gage height, in feet, and discharge, in million gallons a day)

2.1	0.06	3.1	18.5
2.2	.20	3.5	40.0
2.3	.59	4.0	78.0
2.4	1.30	4.5	135
2.5	2.40	5.0	210
2.6	3.90	6.0	390
2.8	8.40		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.98	1.80	0.30	3.60	79.7	2.53	2.40	0.78	0.65	0.65	32.0	13.4
2	.65	3.10	.27	1.50	91.9	8.74	3.44	.65	.59	.27	297	3.60
3	.46	1.10	.25	2.15	15.8	4.30	6.19	8.79	8.04	.22	97.6	1.90
4	.98	.91	.27	1.04	23.4	2.40	2.00	310	2.00	.20	53.0	2.15
5	.59	.91	.25	*5.64	35.4	1.80	3.60	80.5	1.80	39.5	22.4	2.40
6	.65	1.60	.18	39.3	20.2	1.60	*2.95	15.5	6.20	104	16.8	1.60
7	.98	.84	.18	37.3	52.0	1.50	1.90	13.3	1.80	14.5	9.56	1.10
8	3.31	34.9	.16	5.30	26.3	1.50	1.40	8.69	1.10	5.50	13.2	1.04
9	*4.14	4.98	.88	2.65	37.5	19.0	1.17	7.87	.84	18.2	7.56	.84
10	1.60	2.53	1.40	1.60	16.5	60.0	29.4	4.10	8.61	21.6	4.90	.72
11	.46	1.17	.72	1.60	7.60	32.5	4.10	3.10	12.5	5.10	3.10	.59
12	7.88	1.10	.59	1.40	14.4	15.8	2.80	2.40	4.62	3.40	2.65	.59
13	.91	1.40	.78	.78	*6.90	53.6	10.7	2.15	1.30	2.80	4.77	1.04
14	.46	7.29	.33	1.36	55.6	19.9	4.10	1.80	.78	2.65	27.2	.98
15	.91	2.80	.25	16.9	8.98	118	2.53	1.60	.52	1.60	30.8	1.17
16	5.17	5.22	17.8	2.40	6.20	43.1	2	1.60	.46	1.30	10.4	1.60
17	2.65	17.3	6.14	18.9	4.50	19.8	1.60	1.30	.41	1.10	11.2	1.04
18	2.15	2.95	1.70	6.42	5.10	9.85	1.40	*1.17	.41	.98	4.10	.65
19	4.02	1.80	.91	25.7	25.3	79.0	1.17	1.10	.52	.91	3.10	.72
20	1.40	1.30	4.67	6.20	19.5	12.7	1.10	1.10	.52	*.78	2.53	.98
21	20.8	1.40	1.70	10.8	5.30	20.7	1.40	1.04	.41	.91	3.25	.78
22	4.90	1.17	1.60	3.40	4.50	11.6	1.40	1.17	1.40	.65	1.90	21.7
23	68.0	.84	2.95	2.65	6.40	43.6	1.09	1.17	.41	.65	1.50	4.50
24	39.2	.65	13.6	4.52	4.50	10.1	33.7	1.10	8.26	3.50	1.30	1.60
25	88.1	.65	4.51	2.15	3.10	27.0	17.0	1.50	1.90	1.30	1.10	1.04
26	10.7	.59	1.10	1.56	30.2	8.40	2.25	1.04	.65	1.70	1.17	.91
27	5.10	.65	.65	5.28	15.9	7.10	1.80	.84	.37	7.10	2.42	1.10
28	3.25	.52	.52	1.70	6.40	4.90	2.00	.72	.30	45.2	*2.65	5.70
29	2.40	.91	.41	27.6	3.90	2.95	1.80	--------	.27	33.4	1.80	1.70
30	7.07	.46	4.42	3.90	3.60	5.10	1.40	--------	3.13	23.4	8.51	.91
31	1.80	*.30	----------	75.9	----------	3.10	.98	--------	3.13	----------	2.40	----------
Total	291.67	103.14	69.49	321.20	636.58	652.17	150.77	476.08	73.90	343.07	681.87	78.05
Mean												
Mgd	9.41	3.33	2.32	10.4	21.2	21.0	4.86	17.0	2.38	11.4	22.0	2.60
Cfs	14.6	5.15	3.59	16.1	32.8	32.5	7.52	26.3	3.68	17.6	34.0	4.02
Ac-ft	895	317	213	986	1,950	2,000	463	1,460	227	1,050	2,090	240

Calendar Year 1964: Max 131 Min 0.14 Mean mgd 9.67 Mean cfs 15.0 Ac-ft 10,860
Fiscal Year 1964-65: Max 310 Min 0.16 Mean mgd 10.6 Mean cfs 16.4 Ac-ft 11,890

* Discharge measurement made on this day.

Peak discharge (base, 600 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-25	0700	7.34	727	1,120	4-6	1200	6.90	605	936
12-15	0400	7.74	847	1,310	5-2	1500	10.18	1,920	2,970
2-4	0430	9.60	1,600	2,480					

2130. Waikele Stream at Waipahu

Location.--Lat 21°23'09", long 158°00'48", on left bank 300 ft upstream from bridge on Farrington Highway, 0.3 mile south of Waipahu, and 2.5 miles west of Pearl City.

Drainage area.--45.7 sq mi.

Records available.--June to October 1951, December 1951 to October 1959, July 1960 to June 1965.

Gage.--Water-stage recorder and concrete control. Datum of gage is 1.37 ft above mean sea level, datum of 1929. Prior to July 1, 1960, at site 300 ft downstream at datum 1.30 ft higher.

Average discharge.--12 years (1952-59, 1960-65), 25.3 mgd (39.1 cfs).

Extremes.--Maximum discharge during year, 5,280 mgd (8,170 cfs) May 2 (gage height, 7.47 ft), from rating curve extended above 460 mgd on basis of slope-area measurement at gage height 6.51 ft; minimum, 8.07 mgd (12.5 cfs) Sept. 2, 10, 11.
1951-65: Maximum discharge, 8,790 mgd (13,600 cfs) Nov. 28, 1954 (gage height, 14.82 ft, site and datum then in use), from rating curve extended above 470 mgd on basis of slope-area measurement of peak flow; minimum, 2.44 mgd (3.78 cfs) Sept. 28, 29, 1962.

Remarks.--Records good except those for period of no gage-height record, which are poor. Diversions above station for irrigation of sugarcane in Waipahu area.

Rating table (gage height, in feet, and discharge, in million gallons a day)

1.8	6.60	3.2	145
2.0	11.3	3.5	250
2.3	23.0	4.0	470
2.6	42.0	5.0	1,260
2.9	82.0		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	10.8	17.3	13.5	10.8	98.0	22.6	33.4	25.0	21.2	16.5	37.8	19.6
2	13.9	17.7	9.48	10.8	180	23.5	32.8	23.0	22	17.7	937	22.6
3	13.9	14.9	8.70	13.5	39.6	28.0	38.0	22.1	26	19.0	252	15.3
4	13.5	12.3	10.0	14.2	32.2	24.0	30.4	*991	30	17.3	111	14.9
5	15.3	11.9	13.5	*11.9	54.0	21.2	31.6	223	28	49.7	82.8	15.3
6	11.9	12.3	13.9	29.0	67.6	20.8	42.9	48.6	26	247	44.2	15.3
7	10.5	11.6	13.9	43.1	99.2	*22.1	32.2	39.2	22	48.0	34.0	14.9
8	10.5	23.3	11.3	16.5	88.5	22.6	27.5	34.8	24	24.5	28.6	14.9
9	10.8	26.2	8.70	12.9	46.6	23.9	29.2	33.4	26	24.0	33.4	14.2
10	11.9	16.5	8.28	13.9	54.6	101	99.3	27.5	28	39.7	25.5	13.9
11	14.9	14.2	8.49	14.2	26.5	56.6	54.3	26.5	30	24.0	24.5	13.9
12	14.5	14.2	12.3	11.6	22.4	40.4	33.4	26.0	36	18.1	21.6	14.2
13	12.6	16.1	14.5	11.9	24.5	96.1	59.5	23.0	30	23.0	18.5	16.1
14	11.3	12.9	10.5	10.3	92.5	41.2	47.5	22.6	26	19.4	71.2	12.9
15	10.8	16.5	10.0	11.6	29.8	247	32.8	25.5	24	18.5	224	10.8
16	10.8	13.9	10.5	13.5	22.1	120	29.8	27.0	26	20.3	48.6	*11.0
17	11.9	16.5	12.9	16.5	19.4	77.7	29.2	23.0	28	21.6	34.0	12.3
18	12.9	16.9	13.9	17.7	18.1	37.2	*28.0	21.6	30	20.8	23.5	12.9
19	14.2	14.5	14.5	21.8	21.1	405	27.0	20.8	32	21.2	25.0	13.9
20	11.9	16.5	16.1	24.8	37.2	76.3	26.5	20.3	24	19.0	24.0	12.9
21	21.8	13.2	14.2	20.7	25.0	59.5	29.2	20.3	22	12.3	21.6	11.6
22	20.8	14.5	13.9	17.7	20.8	55.6	27.0	18.5	*24.5	10.8	22.1	18.8
23	75.4	14.9	13.9	12.6	138	298	25.0	19.4	23.5	14.3	20.8	20.7
24	96.2	10.5	13.9	13.2	29.8	75.6	38.0	18.5	22.1	19.8	19.8	14.5
25	164	*9.74	16.9	13.5	24.0	77.2	80.4	19.0	24.5	20.3	17.7	13.2
26	34.8	12.3	14.9	10.0	38.7	50.8	30.4	20.3	18.5	21.2	15.3	15.3
27	22.1	12.6	15.7	11.6	64.4	43.1	26.5	22.1	16.9	20.8	15.3	13.2
28	18.1	11.9	13.5	12.3	30.4	35.6	24.5	22.1	16.1	37.0	15.3	10.8
29	17.7	11.9	10.0	20.7	27.0	32.8	29.8	---------	15.3	80.8	15.3	11.6
30	17.7	12.3	11.0	18.5	24.5	34.8	27.5	---------	17.2	46.0	14.5	11.6
31	17.3	11.9	---------	66.9	---------	35.6	26.5	---------	18.1	---------	14.2	---------
Total	754.7	451.94	372.85	548.2	1496.5	2305.8	1130.1	1864.1	757.9	992.6	2293.1	433.1
Mean												
Mgd	24.3	14.6	12.4	17.7	49.9	74.4	36.5	66.6	24.4	33.1	74.0	14.4
Cfs	37.6	22.6	19.2	27.4	77.2	115	56.5	103	37.8	51.2	114	22.3
Ac-ft	2320	1390	1140	1680	4590	7080	3470	5720	2330	3050	7040	1330

Calendar Year 1964:	Max	405	Min	8.28	Mean mgd	30.2	Mean cfs	46.7	Ac-ft	33,930
Fiscal Year 1964-65:	Max	991	Min	8.28	Mean mgd	36.7	Mean cfs	56.8	Ac-ft	41,140

Peak discharge (base, 700 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
11-23	1300	4.71	780	1,210	4- 6	1230	4.77	1,050	1,620
12-19	1130	5.78	1,320	2,040	5- 2	1730	7.47	5,280	8,170
12-23	0900	4.69	770	1,190	5-15	0500	4.69	981	1,520
2- 4	0230	6.51	3,240	5,010					

* Discharge measurement made on this day.
Note.--No gage-height record Mar. 2-21.

2160. Waiawa Stream near Pearl City

Location.--Lat 21°23'55", long 157°58'50", on left bank 100 ft upstream from lower bridge on Farrington Highway, 0.6 mile northwest of Pearl City, and 2.0 miles northeast of Waipahu.

Drainage area.--26.4 sq mi.

Records available.--June 1952 to June 1965.

Gage.--Water-stage recorder (digital since July 24) and concrete control. Datum of gage is 1.81 ft above mean sea level, datum of 1929.

Average discharge.--13 years, 16.7 mgd (25.8 cfs).

Extremes.--Maximum discharge during year, 9,070 mgd (14,000 cfs) May 2 (gage height, 17.38 ft), from rating curve extended above 680 mgd as explained below; minimum, 1.33 mgd (2.06 cfs) June 11, 12.

1952-65: Maximum discharge, 10,900 mgd (16,900 cfs) Nov. 28, 1954 (gage height, 19.27 ft), from rating curve extended above 680 mgd on basis of slope-area measurement at gage height 17.1 ft; minimum, that of June 11, 12, 1965.

Remarks.--Records good. Occasional small diversions for irrigation above station.

Rating table (gage height, in feet, and discharge, in million gallons a day)

1.4	1.21	3.0	75.0
1.5	1.92	3.5	151
1.6	2.90	4.0	263
1.8	5.50	6.0	730
2.1	11.8	8.0	1,400
2.3	19.3	10.0	2,380
2.6	37.3		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	5.67	6.40	3.56	7.59	252	8.22	8.08	3.82	3.85	6.07	31.1	6.60
2	4.92	6.74	3.49	6.15	323	12.1	7.54	4.18	3.96	6.11	1,900	5.74
3	4.35	6.03	3.62	5.15	41.2	11.2	9.08	4.16	4.87	5.94	295	2.69
4	4.06	6.16	4.31	5.23	68.3	8.85	6.97	1,020	6.40	4.74	88.1	2.03
5	3.93	5.58	4.72	*4.92	137	6.37	10.3	725	6.15	7.08	44.3	1.92
6	4.35	5.21	4.57	44.2	72.9	5.22	12.8	49.1	4.98	254	25.1	1.86
7	4.35	5.29	4.12	72.2	81.4	5.15	7.99	32.8	4.35	42.7	17.3	1.77
8	5.21	59.9	4.77	16.0	63.7	6.16	8.29	32.6	4.41	16.0	17.7	1.62
9	5.07	16.4	4.73	8.01	54.2	62.2	7.89	29.6	4.99	21.8	18.0	1.48
10	4.78	7.70	5.58	6.46	53.4	248	93.7	12.9	5.19	36.8	6.69	1.42
11	5.07	6.44	5.63	5.17	22.9	88.4	*21.0	9.43	5.64	13.3	4.81	1.37
12	5.36	5.65	5.17	4.94	32.0	36.1	11.9	7.63	14.4	11.0	3.93	1.78
13	5.50	5.73	5.17	4.93	22.3	175	12.5	6.54	6.92	8.28	4.55	1.93
14	5.50	5.58	5.31	4.84	184	52.3	14.7	5.62	4.93	9.63	32.3	1.91
15	5.67	5.39	5.36	19.2	29.0	176	11.7	5.30	4.33	6.73	53.9	2.22
16	6.19	6.13	4.51	9.52	16.8	92.1	10.2	5.95	4.80	5.80	19.8	*3.75
17	5.07	33.2	4.63	28.9	11.3	61.7	9.17	6.03	5.39	5.08	11.1	3.02
18	5.50	14.4	4.94	11.5	11.3	25.8	8.05	6.32	6.05	4.58	6.64	2.93
19	6.36	13.7	4.28	31.1	15.1	569	8.35	6.18	6.55	4.30	5.56	2.94
20	5.21	10.2	3.76	15.9	*37.3	70.9	7.62	5.38	5.24	4.05	3.89	3.00
21	55.8	7.77	3.79	13.5	13.9	40.7	7.66	4.55	4.82	4.04	3.19	3.00
22	15.6	6.57	4.25	9.95	11.5	32.9	7.46	5.82	5.32	4.23	2.95	3.02
23	195	5.85	4.38	6.71	14.7	92.6	7.62	6.62	5.76	4.35	2.37	3.90
24	100	5.59	5.10	5.75	14.1	43.2	29.0	5.33	*5.29	4.06	2.05	3.23
25	226	*5.44	6.67	6.04	11.8	68.7	57.9	5.10	5.60	4.11	1.92	3.17
26	32.2	5.55	5.96	5.55	25.7	29.2	9.28	4.86	5.32	4.00	1.91	2.93
27	14.4	4.82	5.23	5.70	40.9	22.3	5.78	4.47	4.87	4.45	1.91	2.86
28	9.06	4.41	5.23	6.57	25.3	20.7	4.78	4.03	4.33	48.6	1.89	2.82
29	6.79	4.19	5.47	38.4	15.0	13.3	4.36	---------	4.60	70.7	1.91	2.89
30	6.88	3.86	5.41	10.8	9.33	13.7	4.04	---------	6.15	29.0	1.83	3.05
31	6.60	3.69	---------	170	---------	13.4	3.91	---------	6.22	---------	3.56	---------
Total	770.45	289.57	143.72	590.88	1,711.33	2,111.47	429.62	2,019.32	171.68	651.53	2,615.26	82.85
Mean												
Mgd	24.9	9.34	4.79	19.1	57.0	68.1	13.9	72.1	5.54	21.7	84.4	2.76
Cfs	38.5	14.5	7.41	29.6	88.2	105	21.5	112	8.57	33.6	131	4.27
Ac-ft	2,360	889	441	1,810	5,250	6,480	1,320	6,200	527	2,000	8,030	254

Calendar Year 1964:	Max	569	Min	3.00	Mean mgd	25.0	Mean cfs	38.7	Ac-ft	28,130
Fiscal Year 1964-65:	Max	1,900	Min	1.37	Mean mgd	31.7	Mean cfs	49.0	Ac-ft	35,560

* Discharge measurement made on this day.

Peak discharge (base, 1,000 mgd, revised)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-23	1700	6.99	1,020	1,580	2-4	0730	15.37	6,710	10,400
7-25	0900	7.57	1,230	1,900	4-6	1230	6.96	1,010	1,560
12-10	1600	9.20	1,950	3,020	5-2	1600	17.38	9,070	14,000
12-19	1300	12.03	3,690	5,710					

2190. Hawaiian Electric Co. tunnel at Waiau, near Pearl City

Location.--Lat 21°23'30", long 157°57'55", on right bank of ditch at Hawaiian Electric Co. Waiau powerplant, 20 ft downstream from tunnel portal, and 0.6 mile east of Pearl City.

Records available.--October 1939 to April 1942, July 1942 to December 1945, July 1952 to June 1965.

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 2.91 ft above mean sea level, datum of 1929. Prior to July 1, 1952, at site 120 ft downstream at datum 2.27 ft lower.

Average discharge.--15 years (1940-41, 1944-45, 1952-65), 10.5 mgd (16.2 cfs).

Extremes.--1939-45, 1952-65: Maximum daily discharge, 17.3 mgd (26.8 cfs) Mar. 26, 27, 1940; minimum daily, 6.0 mgd (9.3cfs) Aug. 3, 1941.

Remarks.--Records good. Water is used for cooling condensers in powerplant and afterwards for irrigation of sugarcane.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	9.90	9.68	9.68	9.68	9.76	10.7	11.2	11.6	11.4	10.9	11.1	11.5
2	9.90	9.68	9.65	9.68	9.74	10.7	11.3	11.6	11.3	10.9	11.4	11.5
3	9.90	9.79	9.68	9.72	9.74	10.8	11.3	11.6	11.3	10.9	11.3	11.4
4	9.90	9.79	9.68	9.72	9.74	10.9	11.3	11.6	11.3	11.0	11.3	11.4
5	9.90	9.79	9.73	9.69	9.78	10.9	11.4	11.6	11.2	10.9	11.4	11.5
6	9.90	9.79	9.80	9.68	9.79	10.9	11.4	11.6	11.3	11.0	11.4	11.5
7	9.68	9.79	9.88	9.68	9.81	*10.9	11.4	11.7	11.3	11.0	11.4	11.5
8	9.57	9.79	9.85	9.69	9.79	10.8	11.4	11.7	11.3	11.0	11.4	11.4
9	9.57	9.79	9.80	*9.69	9.79	10.8	11.4	11.6	11.3	11.0	11.5	11.4
10	9.57	9.68	9.75	9.69	9.79	10.9	11.6	11.6	11.3	11.0	11.4	11.4
11	9.57	9.68	9.75	9.69	9.79	10.9	11.5	11.5	11.2	11.0	11.4	11.4
12	9.57	9.68	9.77	9.65	9.79	11.0	*11.5	11.5	11.1	11.0	11.4	11.4
13	9.57	9.68	9.76	9.67	9.79	11.0	11.5	11.6	11.1	11.0	11.5	11.4
14	9.57	9.80	9.72	9.66	9.79	11.0	11.6	11.6	11.2	11.0	11.6	*11.4
15	9.57	9.88	9.70	9.67	9.90	11.0	11.6	11.6	11.1	11.0	11.6	11.3
16	9.68	9.81	9.69	9.68	9.79	11.1	11.6	11.5	11.1	11.1	11.6	11.3
17	9.68	9.76	9.72	9.68	9.79	11.1	11.6	11.5	11.0	11.2	11.6	11.2
18	9.68	9.73	9.71	9.69	9.90	11.0	11.6	11.5	11.0	11.3	11.6	11.2
19	9.68	*9.73	9.73	9.67	9.90	11.2	11.6	11.4	11.0	11.2	11.6	11.3
20	9.68	9.69	9.72	9.68	9.90	11.0	11.6	11.4	11.1	11.1	11.6	11.3
21	9.68	9.68	9.72	9.68	10.1	11.0	11.7	11.4	11.2	11.1	11.7	11.2
22	9.68	9.69	9.69	9.70	10.1	11.0	11.6	11.4	11.1	11.1	11.7	11.2
23	9.68	9.72	9.70	9.70	10.2	11.1	11.7	11.4	11.1	11.1	11.7	11.2
24	9.90	9.71	9.69	9.67	10.3	11.1	11.7	11.3	11.0	11.1	11.7	11.2
25	9.79	9.66	9.70	9.68	10.3	11.1	11.7	11.3	11.0	11.1	11.6	11.2
26	9.79	9.67	9.71	9.67	10.6	11.1	11.7	11.3	11.0	11.1	11.6	11.2
27	9.79	9.67	9.70	9.67	10.7	11.2	11.7	11.4	11.0	11.1	11.6	11.3
28	9.79	9.68	9.69	9.69	10.8	11.1	11.7	11.4	11.1	11.1	11.6	11.2
29	9.68	9.68	9.69	9.68	10.8	11.1	11.6	---------	11.0	11.1	11.6	11.2
30	9.68	9.68	9.69	9.73	10.8	11.2	11.6	---------	11.0	11.1	11.7	11.1
31	9.68	9.68	---------	9.72	---------	11.2	11.7	---------	*10.9	---------	11.6	---------
Total	301.18	301.53	291.75	300.25	300.77	340.8	357.8	322.2	345.3	331.5	357.2	339.7
Mean												
Mgd	9.72	9.73	9.72	9.69	10.0	11.0	11.5	11.5	11.1	11.0	11.5	11.3
Cfs	15.0	15.1	15.0	15.0	15.5	17.0	17.8	17.8	17.2	17.0	17.8	17.5
Ac-ft	924	925	895	921	923	1050	1100	989	1060	1020	1100	1040

Calendar Year 1964:	Max	11.4	Min	9.57	Mean mgd	10.3	Mean cfs	15.9	Ac-ft	11560		
Fiscal Year 1964-65:	Max	11.7	Min	9.57	Mean mgd	10.7	Mean cfs	16.6	Ac-ft	11950		

* Discharge measurement made on this day.

2230. Waimalu Stream near Aiea

Location.--Lat 21°23'34", long 157°57'03", on right bank 350 ft downstream from bridge on Moanalua Road and 1.3 miles northwest of Aiea Post Office.

Drainage area.--6.07 sq mi.

Records available.--January 1952 to June 1962, July 1963 to June 1965.

Gage.--Water-stage recorder (digital) and concrete control. Datum of gage is 1.97 ft above mean sea level. Prior to Feb. 21, 1961, at site 350 ft upstream at different datums. Feb. 21, 1961, to June 30, 1962, at datum 0.13 ft lower than present datum.

Average discharge.--12 years (1952-62, 1963-65), 4.52 mgd (6.99 cfs).

Extremes.--Maximum discharge during year, 4,480 mgd (6,930 cfs) May 2 (gage height, 6.30 ft), from rating curve extended above 480 mgd on basis of slope-area measurement of peak flow; minimum, 0.01 mgd (0.02 cfs) Apr. 24.
1952-65: Maximum discharge, that of May 2, 1965; no flow Sept. 25, Sept. 28 to Oct. 1, 1958.
Maximum discharge of flood of May 14, 1963, was 3,440 mgd (5,320 cfs), from slope-area measurement of peak flow.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Occasional small diversions for irrigation of truck farms above station.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0	0	1.0	8.40
.1	.07	1.1	12.0
.2	.20	1.3	22.5
.3	.42	1.5	40.0
.4	.80	1.8	80.0
.5	1.34	2.2	170
.7	3.15	2.6	330
.9	6.10	2.9	540

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.6	0.63	0.33	*0.85	6.23	0.95	1.14	0.28	0.26	0.09	9.93	3.42
2	.6	.46	.29	.85	69.6	.74	.84	.27	.22	.1	*537	1.9
3	.7	.49	.26	.62	17.7	1.80	1.34	.30	.18	.1	100	1.0
4	.5	.48	.26	.52	34.6	1.27	.80	280	.16	.1	38.9	1.0
5	.5	.50	.25	.55	41.5	.70	2.38	204	.20	3.0	27.0	.7
6	.5	.40	.24	17.1	26.5	.52	2.26	16.0	.20	38	16.8	.7
7	.6	.40	.22	30.4	22.0	.62	1.13	26.2	.30	8.0	12.3	.5
8	.5	20.7	.27	4.48	17.6	.80	.86	15.6	.28	3.87	8.21	.5
9	.4	4.03	.43	2.64	10.9	26.2	.56	12.0	.22	7.24	7.30	.5
10	.5	1.90	.36	1.10	10.6	41.1	27.6	3.45	.22	11.9	3.36	.5
11	.5	*.78	.33	.63	4.74	33.2	5.01	2.25	.45	3.35	2.13	.4
12	.4	.54	.32	.73	11.2	17.6	*2.26	1.50	.59	1.50	1.62	.4
13	.4	.57	.34	.46	5.18	60.5	1.50	.95	.26	1.24	3.36	.4
14	.4	.58	.43	.34	58.5	15.0	1.81	.66	.18	3.91	26.8	.4
15	.4	.69	.64	6.72	7.80	41.8	1.04	.48	.14	1.20	35.3	.4
16	.4	1.40	.99	2.06	4.20	23.8	.81	.34	.18	.56	11.7	.4
17	.4	183	.86	14.0	2.95	19.4	.71	.24	.32	.29	7.25	.4
18	.6	3.76	1.13	9.46	3.60	6.48	.85	.24	.26	.19	3.52	.40
19	.6	3.35	.76	23.0	9.00	*90.7	.63	.24	.22	.12	*4.44	.34
20	.4	1.85	.63	5.15	13.8	19.2	.32	.22	.39	.08	2.40	.31
21	10.5	1.06	.75	4.24	4.20	8.57	.36	.20	.6	.07	1.76	.41
22	*6.0	.70	.83	2.28	2.45	6.67	.30	.22	.1	.04	1.61	.33
23	55.9	.56	3.19	1.32	*235	16.2	.28	.18	.1	.27	1.01	.31
24	28.7	.46	2.55	.74	4.50	7.15	2.63	.18	.3	.10	.78	.31
25	59.2	.40	2.55	.49	2.45	13.5	12.9	.28	*.66	.16	.55	.30
26	8.90	.35	.59	.38	1.50	5.88	1.49	.34	.32	.15	.50	.3
27	3.45	.42	.55	.33	2.07	4.17	.68	.32	.28	.21	.51	.3
28	2.07	.58	.55	.33	6.50	4.00	.47	.28	.24	4.53	.48	.3
29	1.30	.77	.62	10.8	2.85	1.92	.38	---------	.22	47.8	.78	.3
30	.90	.44	.74	1.66	1.50	1.87	.30	---------	.20	15.8	1.55	.3
31	.79	.37	---------	28.0	---------	2.36	.29	---------	.10	---------	1.10	---------
Total	187.61	67.92	22.26	172.23	464.64	474.67	73.92	567.22	8.35	153.97	869.95	17.73
Mean												
Mgd	6.05	2.19	0.742	5.56	15.5	15.3	2.38	20.3	0.269	5.13	28.1	0.591
Cfs	9.36	3.39	1.15	8.60	24.0	23.7	3.68	31.4	0.416	7.94	43.5	0.914
Ac-ft	576	208	68	529	1430	1460	227	1740	26	473	2670	54

Calendar Year 1964: Max 90.7 Min 0.22 Mean mgd 5.89 Mean cfs 9.11 Ac-ft 6620
Fiscal Year 1964-65: Max 537 Min 0.04 Mean mgd 8.44 Mean cfs 13.1 Ac-ft 9460

* Discharge measurement made on this day.
Note.--No gage-height record July 1-22, Mar. 21-24, Apr. 2-7, June 2-17, 26-30.

Peak discharge (base, 250 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-25	0830	2.73	411	636	2-4	2300	4.31	1,800	2,790
11-14	0130	2.85	500	774	5-2	1530	6.30	4,480	6,930
12-19	1230	2.94	572	885					

2240. Pearl Harbor Springs at Kalauao, near Aiea

Location.--Lat 21°23'05", long 157°56'45", on left bank 900 ft downstream from Oahu Sugar Co. pump 6, 1.1 miles west of Aiea, and 7.6 miles northwest of Honolulu.

Records available.--March 1931 to June 1962, April 1964 to June 1965.

Gage.--Water-stage recorder and sharp-crested weir. Datum of gage is 1.38 ft below mean sea level, datum of 1929.

Average discharge.--32 years, 15.7 mgd (24.3 cfs), unadjusted for pumpage.

Extremes.--1931-62, 1964-65: Maximum daily discharge, 25 mgd (39 cfs) Feb. 17-26, 1938, Feb. 23, 24, 1955; minimum daily, 7.06 mgd (10.9 cfs) Aug. 10, 1960.

Remarks.--Records good except those for periods of no gage-height record, which are poor. When water is needed for irrigation of sugarcane, Oahu Sugar Co. pump 6 diverts about 7 mgd as a high-lift pump or 9 mgd as a low-lift pump. Surface runoff from floods not included in figures of discharge.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	14.5	12.1	12.1	12.4	13.5	14.9	16.0	14	16	13	15	16.7
2	14.2	12.1	12.4	13.5	13.5	14.9	16.0	15	14	14	16	16.3
3	14.2	11.8	13.5	13.5	13.5	14.9	16.3	17	13	16	17	16
4	13.8	11.4	11.4	13.5	13.5	14.9	16.3	17	13	15	17	16
5	13.8	13.1	13.5	13.5	13.5	14.9	16.7	17	13	14	17	16
6	13.8	13.1	13.8	13.5	13.5	14.9	17.0	16	13	14	17	16
7	12.1	13.1	13.8	13.5	13.5	12.1	17.4	16	13	15	17	16
8	11.4	13.1	12.4	13.5	13.5	12.4	18.1	16	14	16	17	16
9	12.1	13.1	10.4	11.1	13.5	13.1	18.5	16	15	16	17	13
10	12.1	13.1	13.5	13.5	13.5	14.9	18.8	16	16	16	*17	14
11	12.1	13.1	13.5	13.5	13.5	14.9	18.5	16	16	16	*17.0	14
12	13.8	13.1	13.5	10.7	13.8	14.9	18.8	16	14	16	17.0	16
13	12.1	13.5	12.4	10.7	13.8	14.9	18.8	16	13	16	17.0	16
14	12.1	11.1	12.1	10.7	13.8	14.9	18.5	16	13	16	17.0	16
15	13.8	12.1	12.1	13.5	13.8	15.2	*17.4	16	13	16	17.0	16
16	13.8	12.1	11.8	13.5	13.8	15.2	17	16	13	16	17.0	14
17	13.8	11.8	11.8	13.5	12.1	15.2	17	15	14	16	17.0	16
18	13.8	12.1	11.4	13.1	11.8	15.2	17	14	15	16	17.0	16.3
19	13.8	11.4	13.5	*13.5	11.8	15.2	17	13	16	16	*15.2	16.3
20	13.5	13.1	13.5	13.1	13.8	15.2	17	14	16	16	16.7	16.3
21	13.5	13.1	13.5	13.5	14.2	15.2	17	16	16	13	14.9	16.0
22	13.8	13.1	13.5	13.5	14.2	15.2	17	16	16	12	16.7	16.0
23	13.8	13.1	13.1	13.5	14.2	15.2	17	14	16	13	16.7	16.0
24	13.8	13.1	13.1	13.5	14.2	15.6	17	16	16	16	16.7	12.8
25	13.5	*13.5	13.1	11.8	14.5	16.7	17	14	16	16	13.8	16.0
26	13.5	13.5	11.8	11.1	14.5	16.7	16	15	16	16	13.8	16.0
27	13.5	13.5	11.4	11.1	14.9	17.0	16	16	16	14	14.5	16.0
28	13.5	13.5	11.4	11.4	14.9	16.7	16	16	16	13	16.7	12.8
29	13.5	13.5	11.4	13.1	14.9	16.7	16	---------	16	15	16.7	13.5
30	10.1	11.1	11.4	11.8	14.9	13.1	16	---------	16	14	16.7	12.8
31	12.1	11.4	---------	13.5	---------	15.2	16	---------	15	---------	16.7	---------
Total	409.2	391.8	376.1	395.1	412.4	466.0	529.1	435	458	451	508.8	460.8
Mean												
Mgd	13.2	12.6	12.5	12.7	13.7	15.0	17.1	15.5	14.8	15.0	16.4	15.4
Cfs	20.4	19.5	19.3	19.6	21.2	23.2	26.5	24.0	22.9	23.2	25.4	23.8
Ac-ft	1260	1200	1150	1210	1270	1430	1620	1330	1410	1380	1560	1410

Calendar Year 1964:	Max	-	Min	-	Mean mgd	-	Mean cfs	-	Ac-ft	-		
Fiscal Year 1964-65:	Max	18.8	Min	10.1	Mean mgd	14.5	Mean cfs	22.4	Ac-ft	16230		

* Discharge measurement made on this day.

Note.--No gage-height record Jan. 16 to May 10, June 3-17.

2245. Kalauao Stream at Moanalua Road, at Aiea

Location.--Lat 21°23'07", long 157°56'22", on left bank at downstream side of Moanalua Road bridge, 0.4 mile northwest of Aiea Post Office, and 2.3 miles southeast of Pearl City Post Office.

Drainage area.--2.59 sq mi.

Records available.--July 1957 to June 1965.

Gage.--Water-stage recorder and concrete control. Datum of gage is 12.75 ft above mean sea level, datum of 1929.

Average discharge.--8 years, 1.54 mgd (2.38 cfs).

Extremes.--Maximum discharge during year, 976 mgd (1,510 cfs) May 2 (gage height, 5.94 ft), from rating curve extended above 50 mgd as explained below; minimum, 0.02 mgd (0.03 cfs) on many days.

1957-65: Maximum discharge, 1,670 mgd (2,580 cfs) May 14, 1963 (gage height, 6.63 ft), from rating curve extended above 50 mgd on basis of slope-area measurements at gage heights 6.29 and 6.63 ft; minimum, 0.02 mgd (0.03 cfs) on several days in 1959, 1960, and 1965.

Remarks.--Records good except those for period of no gage-height record, which are fair. Some return of irrigation water above station.

Rating table (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used Feb. 13 to Apr. 5, Apr. 12-27, May 11, 12, June 11-30)

0.3	0.02	1.1	6.80
.4	.10	1.3	12.3
.5	.28	1.6	24.0
.6	.64	2.0	48.0
.7	1.20	2.5	92.0
.8	2.00	3.0	150
.9	3.20	3.5	235
1.0	4.75		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.18	0.09	0.08	*0.09	17.9	0.19	0.25	0.19	0.03	0.03	3.96	0.6
2	.21	.09	.09	.09	20.4	.16	.21	.19	.04	.03	155	.5
3	.10	.09	.09	.08	4.40	.14	.19	.19	.05	.04	40.5	.3
4	.12	.08	.09	.09	8.80	.18	.19	107	.06	.03	15.9	.3
5	.12	.09	.10	.08	14.2	.14	.84	47.5	.05	.10	11.0	.2
6	.12	.09	.10	2.40	7.55	.14	.84	5.25	.04	22.6	5.17	.2
7	.13	.09	.09	8.55	3.95	.18	.33	15.4	.04	3.82	3.42	.1
8	.10	4.75	.09	.73	3.95	.16	.30	9.01	.03	.91	3.34	.1
9	.09	.47	.09	.21	3.05	12.3	.19	5.43	.04	2.41	2.08	.1
10	.10	.10	.09	.09	3.20	17.1	12.9	1.23	.04	2.83	.76	.1
11	.09	.09	.09	.08	1.26	12.3	2.10	.73	.04	.70	.13	*.04
12	.09	.09	.09	.18	2.30	8.55	*.78	.50	.04	.07	.09	.04
13	.09	.10	.09	.14	1.26	21.3	.87	.09	.03	1.02	1.12	.04
14	.09	.09	.09	.16	20.4	4.40	.74	.06	.03	1.85	18.0	.04
15	.09	.12	.10	1.07	1.82	13.6	1.09	.04	.03	.16	7.78	.04
16	.09	.10	.10	.28	.73	9.90	.24	.04	.03	.05	4.6	.04
17	.09	6.18	.08	2.65	.30	7.05	.20	.04	.03	.04	2.2	.04
18	.14	.95	.08	4.25	.23	2.20	.19	.04	.03	.04	.7	.04
19	.14	*.39	.08	7.80	4.96	37.4	.19	.04	.03	.04	.4	.04
20	.09	.16	.10	1.13	4.40	6.80	.20	.04	.03	.03	.3	.04
21	2.20	.09	.12	.59	1.13	5.57	.25	.04	.14	.03	.2	.04
22	1.48	.08	.08	.68	.47	6.39	1.04	.04	.03	.03	.2	.04
23	19.1	.09	.47	.21	*.89	7.05	.20	.04	.03	.04	.2	.04
24	11.1	.08	1.01	.09	1.26	4.40	.64	.04	*.06	.04	.2	.04
25	17.9	.08	.54	.09	.78	4.55	6.21	.04	.71	.04	.2	.02
26	2.20	.09	.09	.23	.30	2.00	.68	.04	.03	.04	.1	.02
27	.59	.08	.09	.14	.47	1.26	.27	.04	.03	.16	.1	.02
28	.16	.08	.10	.08	3.05	1.20	.20	.05	.03	5.84	.1	.02
29	.09	.09	.10	1.26	.89	.43	.19	---------	.03	10.9	.1	.02
30	.09	.08	.10	.13	.33	.25	.19	---------	.03	3.46	.1	.02
31	.08	.08	---------	5.98	---------	.47	.19	---------	.03	---------	.3	---------
Total	57.26	15.13	4.51	39.63	134.63	187.76	32.90	193.34	1.89	57.38	278.25	3.18
Mean												
Mgd	1.85	0.488	0.150	1.28	4.49	6.06	1.06	6.90	0.061	1.91	8.98	0.106
Cfs	2.86	0.755	0.232	1.98	6.95	9.38	1.64	10.7	0.094	2.96	13.9	0.164
Ac-ft	176	46	14	122	413	576	101	593	5.8	176	854	9.8

Calendar Year 1964:	Max	37.4	Min	0.08	Mean mgd	1.81	Mean cfs	2.80	Ac-ft	2030		
Fiscal Year 1964-65:	Max	155	Min	0.02	Mean mgd	2.76	Mean cfs	4.27	Ac-ft	3090		

* Discharge measurement made on this day.

Note.--No gage-height record May 16 to June 10.

Peak discharge (base, 150 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-25	0800	3.21	182	282	2-4	0830	4.43	444	687
11-14	0030	3.66	267	413	5-2	1430	5.94	976	1,510
12-19	1230	3.28	192	297					

2260. North Halawa Stream near Aiea

Location.--Lat 21°23'45", long 157°53'35", on left bank 2.7 miles upstream from confluence with South Halawa Stream and 2.7 miles northeast of Aiea Post Office.

Drainage area.--3.45 sq mi.

Records available.--August 1929 to June 1933, July 1953 to June 1965. Monthly discharge only May, June 1931, published in WSP 1319.

Gage.--Water-stage recorder. Altitude of gage is 320 ft (from topographic map).

Average discharge.--15 years (1930-33, 1953-65), 4.04 mgd (6.25 cfs).

Extremes.--Maximum discharge during year, 1,630 mgd (2,520 cfs) May 2 (gage height, 12.49 ft), from rating curve extended above 44 mgd on basis of slope-area measurements at gage heights 10.3, 13.04 and 13.46 ft; no flow for many days.
1929-33, 1953-65: Maximum discharge, 4,300 mgd (6,650 cfs) Feb. 28, 1932 (gage height, 13.36 ft), from rating curve extended above 270 mgd; maximum gage height, 13.46 ft May 14, 1963; no flow at times each year.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Continuous records of rainfall are obtained at station.

Rating table (gage height, in feet, and discharge, in million gallons a day)

4.07	0	5.1	8.40
4.1	.01	5.5	18.2
4.2	.07	6.0	38.5
4.3	.22	6.5	71.0
4.4	.50	7.0	114
4.5	.96	8.0	233
4.6	1.65	9.0	397
4.8	3.70		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0	0.24	0.06	0.01	31.9	0.62	1.09	0.18	0	0	11.6	0.2
2	0	.16	.05	.01	36.1	1.30	.85	.11	0	0	267	.1
3	0	.07	.07	0	7.86	1.34	1.43	.97	.1	0	85.8	.1
4	0	.03	.09	0	13.5	.62	.75	196	.2	0	43.9	0
5	0	.02	.06	0	21.4	.37	4.16	67.3	.1	.98	30	0
6	0	.02	.02	6.34	12.0	.26	1.80	20	0	43.7	18	0
7	0	.04	0	16.4	7.86	.20	*1.22	40	0	7.40	12	0
8	0	9.54	0	2.10	6.60	.18	1.09	28	0	2.30	10	0
9	0	1.28	0	*.66	6.28	39.2	.80	22	0	4.80	8.6	*.16
10	0	.46	0	.31	5.37	37.6	16.4	8.6	0	6.56	5.0	.10
11	.33	.18	0	.20	2.40	21.9	3.40	3.4	0	1.90	.8	.06
12	1.57	.10	0	.11	5.27	19.0	1.90	.9	0	.96	.5	.05
13	.09	.06	0	.04	15.1	34.9	1.90	.7	.1	2.18	8.2	.05
14	.05	.15	0	.29	32.5	11.4	1.29	.5	.1	2.40	50	.05
15	.02	.14	0	4.21	5.80	25.0	.90	.3	*.08	1.03	24	.03
16	.01	.78	.49	.43	2.80	16.7	.66	.3	.03	.54	12	.02
17	.01	8.41	2.14	5.75	*1.72	12.1	.50	.2	.01	.34	8.6	.01
18	.02	1.50	.96	12.8	2.79	5.00	.40	.2	.01	.24	3.2	0
19	.02	*.80	.24	9.95	8.63	52.7	.28	.1	0	.16	2.5	0
20	.01	.40	.58	2.60	9.10	15.0	.22	.1	0	.09	.9	0
21	7.91	.28	.26	1.72	3.92	5.96	.28	0	.08	.03	.8	0
22	3.48	.16	3.17	1.22	1.80	5.84	.24	0	.07	.01	.5	0
23	31.6	.09	1.57	.50	3.19	12.5	.47	0	.03	.01	.3	0
24	17.9	.03	5.94	.28	2.20	5.80	5.99	0	.34	.01	.1	0
25	36.5	.02	1.28	.20	1.43	6.72	10.0	0	.40	0	0	0
26	5.73	.01	.26	.11	.90	4.22	1.65	0	.14	0	0	0
27	1.90	.01	.14	.22	2.27	3.89	1.03	0	.08	.89	0	0
28	.85	.27	.07	.16	4.38	2.70	.70	0	.03	11.5	0	0
29	.43	.08	.03	4.28	1.72	1.57	.46	---------	.01	13.1	0	0
30	.34	.10	.02	.50	.96	2.05	.31	---------	.01	4.48	0	0
31	.26	.11	---------	12.4	---------	1.57	.24	---------	0	---------	0	---------
Total	109.03	25.54	17.50	83.80	257.75	348.21	62.41	389.86	1.92	105.61	604.3	0.93
Mean												
Mgd	3.52	0.824	0.583	2.70	8.59	11.2	2.01	13.9	0.062	3.52	19.5	0.031
Cfs	5.45	1.27	0.902	4.18	13.3	17.3	3.11	21.5	0.096	5.45	30.2	0.048
Ac-ft	335	78	54	257	791	1070	192	1200	5.9	324	1850	2.9

Calendar Year 1964: Max 52.8 Min 0 Mean mgd 3.36 Mean cfs 5.20 Ac-ft 3,770
Fiscal Year 1964-65: Max 267 Min 0 Mean mgd 5.50 Mean cfs 8.51 Ac-ft 6,160

Peak discharge (base, 300 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
11-13	2330	9.80	580	897	2-4	0630	12.13	1,440	2,230
12- 9	1700	8.88	373	577	5-2	1230	12.49	1,630	2,520

* Discharge measurement made on this day.
Note.--No gage-height record Feb. 5 to Mar. 14, May 5 to June 8, June 18-30.

2280. Moanalua Stream near Honolulu

Location.--Lat 21°22'50", long 157°52'20", on left bank 5 miles upstream from mouth and 5 miles north of Honolulu Post Office.

Drainage area.--2.73 sq mi.

Records available.--June 1926 to June 1965.

Gage.--Water-stage recorder and concrete weir. Datum of gage is 338.12 ft above mean sea level (City and County of Honolulu bench mark). Prior to July 1, 1960, at datum 1.0 ft higher.

Average discharge.--39 years, 2.00 mgd (3.09 cfs).

Extremes.--Maximum discharge during year, 930 mgd (1,440 cfs) May 2 (gage height, 8.36 ft), from rating curve extended above 42 mgd on basis of slope-area measurement at gage height 11.82 ft; no flow for many days.
1926-65: Maximum discharge, 2,960 mgd (4,580 cfs) Nov. 18, 1930 (gage height, 12.58 ft, present datum), from rating curve extended above 72 mgd by test on model of station site; no flow at times each year.

Remarks.--Records fair except those for periods of no gage-height record, which are poor. Continuous records of rainfall are obtained at station; no rainfall records July 1, 1964, to Dec. 7, 1964, owing to vandalism.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.82	0	1.8	6.40
.9	.01	2.1	13.0
1.0	.03	2.5	27.1
1.1	.13	3.0	55.0
1.2	.34	3.5	91.0
1.3	.76	4.0	144
1.4	1.42	4.5	212
1.6	3.60		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0	0	0	0	20.4	0.11	0.44	0.03		0	4.07	0.20
2	0	0	0	0	25.4	.08	.2	.03		0	182	.25
3	0	0	0	0	6.08	1.46	.1	.02		0	62.9	.05
4	0	0	0	0	8.30	.16	.1	96.1		0	22.3	.03
5	0	0	0	0	12.9	.06	.9	30.8		0	13.6	.02
6	0	0	0	3.2	9.99	.03	1.2	6.80		9.07	8.63	.01
7	0	0	0	12	12.8	.03	.5	7.44		1.27	4.68	.01
8	0	7.6	0	.4	8.63	.02	.52	5.44		.09	5.35	.01
9	0	.4	0	**.1	4.44	19.8	.25	3.60		.24	3.16	**.01
10	0	0	0	.01	4.32	23.8	12.5	1.70		.94	1.19	.01
11	0	0	0	0	1.80	18.3	*2.26	.94		.05	.66	0
12	0	0	0	0	1.26	12.4	.94	.41		.01	.38	0
13	0	0	0	0	18.8	20.8	.66	.15		.06	.25	0
14	0	0	0	0	22.7	10.3	.44	.05		.09	16.8	0
15	0	0	0	0	4.08	26.0	.25	.03		.01	13.8	0
16	0	0	0	0	2.02	18.5	.13	.02		0	4.56	0
17	0	*9.8	0	0	*1.00	21.9	.07	.01	(*)	0	2.72	0
18	0	1.0	0	5.70	.82	5.12	.04	.01		0	1.34	0
19	0	.1	0	*3.60	1.93	40.7	.03	.01		0	.82	0
20	0	0	0	1.14	5.96	9.09	.03	.01		0	.44	0
21	3.6	0	0	.11	2.87	4.44	.03	.01		0	.28	0
22	2.0	0	0	.03	1.39	4.44	.02	.01		0	.13	0
23	24	0	.4	.02	2.07	7.91	.02	.01		0	.04	0
24	15	0	1.6	.01	.88	3.60	1.46	0		0	.03	0
25	22	0	.5	0	.34	6.14	4.92	0		0	.02	0
26	4.2	0	.2	0	.15	3.27	.48	0		0	.02	0
27	.5	0	0	0	.94	2.83	.16	0		0	.02	0
28	0	0	0	0	1.97	1.90	.10	0		.02	.01	0
29	0	0	0	.08	.76	1.12	.06	---------		.72	.01	0
30	0	0	0	.01	.25	.94	.04	---------		.08	.01	0
31	0	0	---------	12.1	---------	.71	.03	---------		---------	.01	---------
Total	71.3	18.9	2.7	38.51	185.25	265.96	28.88	153.63	0	12.65	350.23	0.60
Mean												
Mgd	2.30	0.61	0.90	1.24	6.18	8.58	0.932	5.49	0	0.422	11.3	0.020
Cfs	3.56	0.94	1.39	1.92	9.56	13.3	1.44	8.49	0	0.653	17.5	0.031
Ac-ft	219	58	83	118	569	816	89	471	0	39	1070	1.8

Calendar Year 1964: Max 40.7 Min 0 Mean mgd 2.28 Mean cfs 3.53 Ac-ft 2570
Fiscal Year 1964-65: Max 182 Min 0 Mean mgd 3.09 Mean cfs 4.78 Ac-ft 3460

Peak discharge (base, 150 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-25	about 0600	6.16	454	702	12-19	1230	4.76	248	384
11-13	2330	7.46	705	1,090	2- 4	0700	6.54	511	791
12-15	0300	4.84	260	402	5- 2	1100	8.36	930	1,440

* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
Note.--No gage-height record July 1 to Oct. 9, Jan. 2-7.

2290. Kalihi Stream near Honolulu

Location.--Lat 21°21'59", long 157°50'49", on right bank 1.9 miles upstream from Kamanaiki Stream and 4.1 miles north of Honolulu Post Office.

Drainage area.--2.61 sq mi.

Records available.--September 1913 to April 1914, July 1914 to June 1965. Monthly discharge only for some periods, published in WSP 1319.

Gage.--Water-stage recorder and concrete control. Datum of gage is 464.40 ft above mean sea level, datum of 1929. Prior to Oct. 12, 1923, at datum 2.00 ft lower.

Average discharge.--51 years (1914-65), 4.55 mgd (7.04 cfs).

Extremes.--Maximum discharge during year, 1,500 mgd (2,320 cfs) Feb. 4 (gage height, 10.0 ft, from floodmarks), from rating curve extended above 180 mgd on basis of indirect measurements at gage heights 8.9, 10.96, and 11.27 ft; minimum, 0.76 mgd (1.18 cfs) July 18-20.

1913-65: Maximum discharge, about 8,000 mgd (about 12,400 cfs) Nov. 18, 1930 (gage height, 13.81 ft), from rating curve extended above 180 mgd on basis of indirect measurements at gage heights 8.9 and 11.27 ft; minimum, 0.06 mgd (0.09 cfs) Oct. 22, 1933.

Remarks.--Records fair except those for periods of no gage-height record, which are poor. No diversion above station.

Rating table (gage height, in feet, and discharge, in million gallons a day)

2.1	0.53	3.0	20.7
2.2	1.21	3.5	39.0
2.3	2.30	4.0	62.0
2.5	6.10	5.0	126

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	*1.05	3.08	*1.05	*1.39	38.6	*3.08	3.3	*1.49	*1.49	*0.97	20	*5.82
2	1.05	2.72	1.13	1.13	*31.7	3.26	3.1	1.49	1.69	1.2	*46	3.26
3	1.05	2.16	1.30	1.05	9.50	3.26	3.0	1.92	1.80	1.2	80	2.90
4	1.05	2.04	1.39	.90	7.85	3.0	3.0	*85.3	1.49	1.1	26	3.26
5	.97	3.44	1.39	2.18	26.1	2.7	11	20.7	1.69	5.0	12	3.62
6	1.13	2.44	1.13	6.55	13.7	2.6	3.44	6.85	1.92	14	11	2.58
7	1.13	1.92	.97	12.9	15.7	2.5	3.62	12.1	1.39	5.40	6.0	2.58
8	1.49	10.8	.97	3.44	8.90	4.5	3.08	8.26	1.30	2.72	9.0	2.30
9	1.05	3.62	1.13	2.16	7.85	36	2.72	5.60	1.21	4.80	7.0	2.16
10	.90	2.90	1.05	1.80	6.10	32	17.8	4.40	7.05	4.80	6.2	2.04
11	2.24	2.44	.97	1.59	5.20	15	3.62	3.62	4.14	3.08	5.8	1.92
12	3.26	2.16	1.13	1.30	7.10	26	3.08	3.44	1.80	2.16	6.4	2.04
13	2.30	2.04	.97	1.21	16.6	24	4.54	3.26	1.49	9.49	6.2	2.04
14	1.21	1.92	.97	1.69	25.5	9.0	2.90	2.90	1.39	3.80	40	2.16
15	1.05	1.80	1.21	2.30	6.10	28	3.0	2.72	1.21	2.58	10	2.04
16	1.30	2.44	2.72	1.59	5.00	30	2.8	2.58	1.21	2.04	6.0	1.92
17	1.05	9.82	1.69	4.64	4.80	14	2.6	2.44	1.05	1.80	5.0	1.80
18	.83	2.72	1.30	18.7	5.00	5.0	2.5	2.16	1.05	1.69	4.40	1.8
19	1.13	2.16	1.13	9.68	8.60	70	2.3	2.04	1.05	1.59	4.20	1.9
20	.90	2.04	1.92	4.20	10.7	11	2.2	1.92	1.05	1.39	4.20	1.9
21	8.48	1.80	1.21	3.44	7.10	7.0	2.5	1.92	2.26	1.30	4.00	1.8
22	7.40	1.59	3.93	2.44	5.60	6.6	2.3	1.92	1.21	1.39	3.62	3.0
23	32.1	1.49	3.39	2.04	8.35	18	2.6	1.92	1.39	1.49	3.26	1.7
24	41.2	1.39	1.69	1.80	5.60	7.3	12	1.92	1.59	1.30	3.08	1.6
25	48.3	1.30	1.30	1.80	5.00	13	4.6	1.69	1.30	1.21	3.08	1.5
26	9.50	1.30	1.13	1.69	5.20	7.0	2.7	1.59	1.13	1.30	4.40	1.6
27	5.20	1.59	.97	1.59	11.9	5.0	3.1	1.80	1.13	2.30	3.62	1.8
28	3.62	1.92	1.05	1.59	6.10	3.6	2.0	1.59	.97	6.0	3.08	2.0
29	3.44	1.30	.90	4.36	4.60	3.8	1.8	---------	1.05	7.0	2.90	1.5
30	3.26	1.21	2.50	1.80	4.00	3.5	1.7	---------	1.13	*3.0	3.08	1.5
31	*2.72	1.21	---------	18.3	---------	3.4	1.6	---------	1.05	---------	2.72	---------
Total	191.36	80.76	43.59	121.25	324.05	403.10	120.50	189.54	50.68	97.10	352.24	68.04
Mean												
Mgd	6.17	2.61	1.45	3.91	10.8	13.0	3.89	6.77	1.63	3.24	11.4	2.27
Cfs	9.55	4.04	2.24	6.05	16.7	20.1	6.02	10.5	2.52	5.01	17.6	3.51
Ac-ft	587	248	134	372	994	1,240	370	582	156	298	1,080	209

Calendar Year 1964:	Max	70	Min	0.83	Mean mgd	5.02	Mean cfs	7.77	Ac-ft	5,640
Fiscal Year 1964-65:	Max	85.3	Min	0.83	Mean mgd	5.60	Mean cfs	8.66	Ac-ft	6,270

Peak discharge (base, 400 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-25	0700	7.22	403	624	5-2	about 1700	-	1,080	1,670
2-4	about 0800	10.0	1,500	2,320					

* Discharge measurement made on this day.

Note.--No gage-height record Dec. 4 to Jan. 5, Jan. 15-31, Apr. 2-6, Apr. 28 to May 17, June 18-30.

2293. Kalihi Stream at Kalihi

Location.--Lat 21°20'29", long 157°52'36", on right bank at Kalihi, 0.4 mile northwest of Bishop Museum, and 2.4 miles northwest of Honolulu Post Office.

Drainage area.--5.18 sq mi.

Records available.--Fiscal year 1962 (annual maximum), July 1962 to June 1965.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 70 ft (from topographic map). Aug. 28, 1961, to June 30, 1962, crest-stage gage at site 600 ft downstream at different datum.

Extremes.--Maximum discharge during year, 3,820 mgd (5,910 cfs) Feb. 4 (gage height, 8.02 ft), from rating curve extended above 510 mgd as explained below; minimum, 0.65 mgd (1.01 cfs) Mar. 16.

1961-65: Maximum discharge, 4,090 mgd (6,330 cfs) May 14, 1963 (gage height, 8.24 ft), from rating curve extended above 510 mgd on basis of slope-area measurement of peak flow.

1962-65: Minimum discharge, that of Mar. 16, 1965.

Flood of May 14, 1960, reached a stage of 8.0 ft, from floodmarks, present site and datum (discharge, 4,100 mgd or 6,350 cfs, from slope-area measurement of peak flow).

Remarks.--Records fair except those for period of no gage-height record, which are poor. No diversion above station. Continuous records of rainfall are obtained at station.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.57	0.88	1.5	47.0
.6	1.25	2.0	80.0
.7	3.10	2.5	155
.8	6.00	3.0	270
1.0	15.4	3.5	410

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.70	5.55	2.05	2.0	80	4.50	4.50	1.55	1.85	1.13	19.8	10.9
2	1.85	3.90	2.25	1.6	60	4.80	4.20	1.55	2.45	1.13	*314	5.40
3	1.70	2.65	2.45	1.4	20	5.10	3.90	2.25	2.85	1.13	96.9	4.50
4	2.05	2.65	2.45	1.2	15	3.60	3.90	*410	2.05	.88	45.8	3.90
5	1.55	5.10	1.91	3.0	50	3.10	12.4	37.8	2.25	11.3	34.1	8.66
6	1.70	3.35	1.13	10	25	2.85	5.10	16.0	2.85	33.9	30.0	6.00
7	2.05	2.45	1.40	20	30	2.65	6.40	21.5	2.05	12.8	11.2	5.70
8	3.78	15.0	1.40	5.0	20	5.40	4.50	16.6	1.40	4.50	17.4	4.80
9	1.25	4.50	2.05	4.0	15	83.6	3.90	9.70	1.25	6.23	13.3	3.90
10	1.13	3.10	1.55	3.0	10	74.1	47.0	8.00	6.17	6.40	10.7	3.35
11	2.08	3.10	1.40	2.5	6.0	38.3	7.20	6.80	8.39	3.90	9.70	2.85
12	4.24	2.65	2.05	2.0	10	48.0	4.80	5.70	1.85	2.45	10.7	2.85
13	1.85	2.65	1.70	1.8	30	51.1	*7.02	4.50	2.00	*13.7	10.2	2.65
14	1.40	2.65	2.45	2.5	50	22.9	3.90	3.60	1.13	7.20	56.8	2.45
15	1.55	2.65	2.65	4.0	10	46.8	4.80	3.10	1.00	4.50	33.2	*237
16	1.70	3.60	5.98	3.0	6.0	54.1	3.10	2.85	.88	3.35	12.3	2.25
17	1.55	15.6	3.90	10	*5.40	28.0	2.65	2.65	.88	2.65	8.00	2.05
18	1.13	4.50	3.10	40	5.70	13.8	2.45	2.45	1.00	2.45	6.80	2.05
19	2.05	*335	2.25	15	8.68	*200	2.25	*2.45	.88	2.45	6.00	2.45
20	1.25	3.10	3.90	8.0	18.0	20.5	2.05	2.25	.88	2.05	6.00	2.25
21	19.2	2.85	2.25	6.0	9.86	12.3	2.85	2.25	4.42	1.70	6.40	2.25
22	15.0	2.45	6.05	4.0	7.60	10.2	2.05	2.65	1.13	1.94	5.70	4.80
23	73.6	2.85	5.19	3.0	18.4	*23.0	2.45	2.45	1.25	2.05	5.70	2.25
24	208	2.65	2.45	2.5	6.80	11.8	13.0	2.05	2.60	1.70	5.40	1.85
25	92.1	2.45	1.85	2.5	5.70	16.6	7.10	1.85	1.70	1.40	5.40	1.70
26	15.4	2.45	1.70	2.2	9.01	11.0	2.85	1.55	.88	1.78	8.80	2.25
27	8.00	2.25	1.52	2.0	18.8	8.40	3.35	2.05	.88	2.88	6.80	2.45
28	5.40	3.10	*2.0	2.0	14.4	6.80	2.25	1.55	.88	*9.82	6.00	3.10
29	4.50	2.25	1.5	9.0	6.40	5.70	2.05	---------	1.00	12.0	5.40	1.70
30	4.20	2.05	3.0	3.0	5.10	6.80	1.85	---------	1.25	9.70	5.40	1.70
31	3.35	2.05	---------	30	---------	4.80	1.70	---------	1.25	---------	4.50	---------
Total	486.31	119.50	75.53	206.2	576.85	830.60	177.52	577.70	61.30	169.07	818.40	105.38
Mean												
Mgd	15.7	3.85	2.52	6.65	19.2	26.8	5.73	20.6	1.98	5.64	26.4	3.51
Cfs	24.3	5.96	3.90	10.3	29.7	41.5	8.87	31.9	3.06	8.73	40.8	5.43
Ac-ft	1490	367	230	633	1770	2550	545	1770	188	519	2510	323

Calendar Year 1964: Max 208 Min 1.13 Mean mgd 9.36 Mean cfs 14.5 Ac-ft 10510
Fiscal Year 1964-65: Max 410 Min 0.88 Mean mgd 11.5 Mean cfs 17.8 Ac-ft 12900

Peak discharge (base, 600 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-24	1200	6.05	1,850	2,860	2-4	0800	8.02	3,820	5,910
12- 9	1730	4.30	750	1,160	5-2	1700	7.00	2,660	4,120
12-19	1130	6.84	2,520	3,900					

* Discharge measurement made on this day.
Note.--No gage-height record Sept. 28 to Nov. 16.

2320. Nuuanu Stream below reservoir 2 wasteway, near Honolulu

Location.--Lat 21°20'55", long 157°49'40", on right bank near Pali Road in upper Nuuanu Valley, 0.2 mile downstream from reservoir 2 wasteway, and 3.5 miles northeast of Honolulu Post Office.

Drainage area.--3.35 sq mi.

Records available.--October 1913 to January 1921, September 1921 to June 1965.

Gage.--Water-stage recorder and sharp-crested weirs. Datum of gage is 631.71 ft above mean sea level, datum of 1929. Prior to Sept. 7, 1915, staff gage at same site at datum 0.03 ft lower and Sept. 7, 1915, to Mar. 31, 1918, at same datum.

Average discharge.--48 years (1914-16, 1917-20, 1922-65), 4.83 mgd (7.47 cfs).

Extremes.--Maximum discharge during year, 550 mgd (851 cfs) Feb. 4 (gage height, 5.09 ft), from rating curve extended above 270 mgd on basis of slope-area measurement at gage height 6.69 ft; minimum, 1.20 mgd (1.86 cfs) Oct. 13.
1913-65: Maximum discharge, 4,520 mgd (6,990 cfs) Jan. 16, 1921 (gage height, 8.74 ft, from floodmarks), from rating curve extended above 270 mgd by test on model of station site; minimum, 0.06 mgd (0.09 cfs) Sept. 10, 11, 1925.

Remarks.--Records fair except those for periods of no gage-height record, which are poor. Low-flow regulation by reservoirs 2, 3, and 4 (capacities, 21, 34, and 1,630 acre-ft, respectively). Honolulu Board of Water Supply diverts ground water from tunnels in drainage area.

Rating table (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used Dec. 19 to Feb. 4)

0.4	1.25	1.5	18.8
1.0	4.40	2.0	42.8
1.1	5.80	3.0	107
1.2	8.30		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.25	3.77	2.10	1.80	16.8	4.54	5.10	4.16	3.56	2.4	6.59	4.28
2	2.20	3.32	2.10	1.61	14.7	4.54	4.96	4.16	3.68	2.4	37.0	3.80
3	2.25	2.90	2.10	1.61	5.10	4.34	4.68	4.34	3.80	2.3	55.2	3.74
4	2.25	2.85	2.05	1.56	4.40	4.22	4.68	76.0	3.68	2.0	32.2	3.56
5	2.10	3.37	2.15	1.80	10.0	4.10	5.38	73.2	3.68	5.6	8.96	3.74
6	2.15	3.00	2.05	5.46	8.33	3.98	4.68	47.0	3.86	8.2	10.4	3.50
7	2.10	2.80	1.95	7.25	6.55	3.92	4.82	43.3	3.68	3.68	7.05	3.50
8	2.20	6.48	1.90	2.60	5.24	4.22	4.68	31.1	3.68	2.70	7.68	3.38
9	2.00	3.38	2.20	2.40	4.96	*8.32	4.40	5.52	3.6	3.86	6.55	3.32
10	2.00	3.00	1.85	1.90	4.82	14.4	9.97	5.24	3.5	4.04	5.66	3.10
11	2.65	2.95	1.85	1.80	4.28	8.96	4.96	4.96	5.80	3.00	5.24	3.10
12	2.55	2.95	1.95	1.85	4.96	16.0	4.68	4.82	2.95	2.40	5.52	3.15
13	2.05	2.85	1.80	1.48	7.57	14.7	*4.68	4.68	2.65	5.99	5.38	3.26
14	2.00	2.90	1.85	1.70	13.8	9.95	4.54	4.68	2.50	3.20	9.16	*3.05
15	1.80	2.95	1.95	3.29	6.55	21.0	4.68	4.54	2.30	2.60	9.62	2.90
16	1.90	3.55	3.10	2.05	5.38	20.4	4.40	4.54	2.15	2.50	6.55	2.95
17	1.75	*3.38	2.73	4.30	5.24	16.5	4.40	4.54	2.15	2.45	5.38	2.85
18	1.70	2.80	2.35	7.61	5.38	12.6	4.34	4.54	2.05	2.35	5.38	2.90
19	2.10	2.60	2.05	4.56	5.52	48.9	4.28	4.54	*1.95	2.30	5.52	2.90
20	1.66	2.60	2.40	2.80	7.55	23.7	4.28	4.54	1.85	2.25	5.38	2.85
21	3.48	2.55	2.00	2.60	5.80	9.95	4.34	4.40	4.3	2.20	5.38	2.85
22	3.10	2.55	2.28	2.35	6.30	6.80	4.22	4.40	2.5	2.20	4.68	2.85
23	12.4	2.60	3.16	2.30	6.05	6.30	4.75	4.28	2.8	2.20	4.40	2.50
24	23.2	2.40	2.00	2.20	6.05	5.38	6.55	4.34	2.9	2.10	4.16	2.45
25	16.7	2.45	1.90	2.35	5.66	7.84	4.40	4.34	2.6	2.00	4.22	2.55
26	4.82	2.35	1.85	2.54	5.80	7.05	4.28	4.34	2.5	1.75	4.67	2.60
27	3.56	2.35	1.80	2.30	8.42	7.55	4.28	4.16	2.4	2.00	4.10	2.65
28	3.50	2.35	1.75	2.00	6.05	6.05	4.22	3.74	2.3	3.73	4.10	2.75
29	3.38	2.30	1.70	2.10	5.38	5.52	4.22	---------	2.5	4.04	4.68	2.55
30	3.20	2.15	*2.30	1.95	4.40	5.66	4.22	---------	2.5	2.75	4.82	2.75
31	3.05	2.15	---------	12.2	---------	5.24	4.22	---------	2.4	---------	4.82	---------
Total	122.05	90.60	63.22	94.32	207.04	322.63	148.29	374.40	92.77	91.19	290.45	92.33
Mean												
Mgd	3.94	2.92	2.11	3.04	6.90	10.4	4.78	13.4	2.99	3.04	9.37	3.08
Cfs	6.10	4.52	3.26	4.70	10.7	16.1	7.40	20.7	4.63	4.70	14.5	4.77
Ac-ft	375	278	194	289	635	990	455	1,150	285	280	891	283

Calendar Year 1964:	Max	48.9	Min	1.48	Mean mgd	4.33	Mean cfs	6.70	Ac-ft	4,870
Fiscal Year 1964-65:	Max	76.0	Min	1.48	Mean mgd	5.45	Mean cfs	8.43	Ac-ft	6,100

Peak discharge (base, 150 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
12-19	1130	4.53	329	509	5-2	1800	3.70	170	263
2-4	0630	5.09	550	851					

* Discharge measurement made on this day.
Note.--No gage-height record Mar. 9, 10, Mar. 21 to Apr. 6.

2390. East Branch Manoa Stream near Honolulu

Location.--Lat 21°19'50", long 157°48'10", on right bank 5 ft downstream from highway bridge, 400 ft upstream from confluence with West Branch, and 4.2 miles northeast of Honolulu Post Office.

Drainage area.--1.06 sq mi.

Records available.--May 1913 to January 1921, August 1925 to June 1965.

Gage.--Water-stage recorder and combination Parshall flume and concrete weir. Datum of gage is 294.50 ft above mean sea level (Honolulu Board of Water Supply bench mark). Prior to May 20, 1914, staff gage at site 200 ft upstream at different datum. May 20, 1914, to Jan. 16, 1921, water-stage recorder at site 30 ft upstream at different datum. Aug. 18, 1925, to Mar. 15, 1928, water-stage recorder at present site at datum 2.99 ft lower, and Mar. 16, 1928, to Oct. 18, 1933, at datum 0.41 ft higher than present datum.

Average discharge.--46 years (1913-20, 1926-65), 3.18 mgd (4.92 cfs).

Extremes.--Maximum discharge during year, 1,640 mgd (2,540 cfs) Feb. 4 (gage height, 6.06 ft), from rating curve extended above 92 mgd by test on model of station site; minimum, 0.92 mgd (1.42 cfs) Mar. 9, 10.
1913-21, 1925-65: Maximum discharge, 2,000 mgd (3,090 cfs) Jan. 16, 1921 (gage height, 10.4 ft, from floodmarks, site and datum then in use), from rating curve extended above 37 mgd; minimum, 0.4 mgd (0.6 cfs) June 7, 8, 1926.

Remarks.--Records fair. Honolulu Board of Water Supply at times diverts a small amount of ground water from tunnel above station. Occasional small diversions for irrigation above station.

Rating table (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used July 1-9, July 26 to Aug. 12, Feb. 4, 7-28, Mar. 6-10, June 15-17)

0.2	0.81	1.2	12.5
.3	1.15	1.5	21.6
.4	2.25	2.0	47.0
.7	5.35	2.5	91.0

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.07	3.04	2.25	1.75	23.6	3.27	3.17	2.43	1.37	2.16	8.37	5.48
2	2.34	2.53	2.25	1.75	17.2	3.99	3.08	2.43	1.30	2.07	14.9	3.89
3	2.16	2.62	2.25	1.91	5.72	3.75	3.08	3.53	1.16	2.25	6.61	2.99
4	2.07	2.80	2.25	1.75	4.89	3.08	3.08	*a60	1.10	2.25	6.01	2.99
5	2.07	5.11	2.43	5.12	16.8	2.99	3.48	5.15	1.04	3.37	5.14	2.80
6	2.25	3.27	2.16	11.0	8.90	2.89	3.17	3.17	1.04	6.75	4.44	2.62
7	2.25	3.08	2.07	10.3	5.98	2.89	4.19	2.80	1.04	3.38	4.38	2.71
8	2.34	11.2	2.07	3.17	4.78	3.87	3.08	2.99	1.23	2.71	4.77	2.53
9	2.40	3.89	2.53	2.53	4.32	11.8	2.99	2.62	.98	5.66	3.68	2.43
10	2.34	3.08	2.16	2.34	3.68	27.6	7.55	2.53	5.44	5.17	3.17	2.43
11	6.29	2.62	2.16	2.16	3.58	9.87	3.38	2.34	4.06	2.89	2.99	2.25
12	3.72	2.68	2.25	1.99	5.43	22.0	3.27	2.25	2.53	2.62	3.17	1.99
13	2.25	2.62	2.07	1.91	7.85	10.9	3.38	2.25	2.43	9.23	3.17	1.75
14	2.43	*3.08	2.07	2.92	5.89	6.60	*3.17	2.16	2.34	3.48	5.93	1.83
15	2.78	2.71	2.34	4.09	3.89	13.7	3.48	1.99	2.25	2.71	6.19	1.98
16	3.53	3.81	5.99	2.43	3.27	7.40	3.27	1.91	2.16	2.62	4.20	2.29
17	2.71	3.58	4.35	6.02	3.17	5.60	3.27	1.91	2.16	2.43	3.68	2.34
18	2.43	2.89	2.99	7.50	3.38	4.43	3.27	1.83	2.16	2.43	2.99	2.53
19	2.76	2.80	2.43	5.64	*8.26	18.7	3.17	1.83	2.07	2.25	3.08	2.80
20	2.56	2.71	3.17	3.08	7.03	5.12	3.08	1.83	2.16	2.25	3.17	2.43
21	11.1	2.62	2.25	2.62	5.16	4.43	*3.17	1.83	2.80	2.25	3.08	3.96
22	11.1	2.89	9.04	2.34	4.51	4.32	2.53	1.99	2.25	2.43	2.89	2.99
23	23.8	3.47	7.46	2.16	4.47	5.58	3.57	1.99	*3.80	2.62	2.34	2.53
24	45.2	2.71	2.16	2.16	3.48	3.89	7.97	1.99	3.50	2.34	3.08	3.94
25	15.8	2.62	1.91	2.25	3.17	5.85	3.99	1.91	2.62	2.16	2.25	2.62
26	4.20	2.53	1.75	2.07	3.17	4.86	2.89	1.44	2.34	2.43	3.63	2.62
27	3.38	2.43	1.67	1.99	4.20	4.10	3.29	1.34	2.25	4.04	2.80	4.18
28	2.80	2.43	1.75	2.07	3.48	3.58	2.80	1.47	2.07	7.80	*2.53	3.17
29	2.43	2.25	1.67	3.98	3.17	3.38	2.71	---------	1.91	5.39	2.99	2.62
30	2.16	2.16	*2.51	2.16	2.99	4.32	2.62	---------	2.46	3.38	3.17	2.99
31	2.25	2.07	---------	13.1	---------	3.38	2.53	---------	2.38	---------	4.26	---------
Total	177.97	98.30	84.41	116.26	185.42	218.14	107.68	121.91	68.40	103.52	133.06	84.68
Mean												
Mgd	5.74	3.17	2.81	3.75	6.18	7.04	3.47	4.35	2.21	3.45	4.29	2.82
Cfs	8.88	4.90	4.35	5.80	9.56	10.9	5.37	6.73	3.42	5.34	6.64	4.36
Ac-ft	546	302	259	357	569	669	330	374	210	318	408	260

Calendar Year 1964:	Max	45.2	Min	1.64	Mean mgd	4.05	Mean cfs	6.27	Ac-ft	4,550		
Fiscal Year 1964-65:	Max	60	Min	0.98	Mean mgd	4.11	Mean cfs	6.36	Ac-ft	4,600		

Peak discharge (base, 200 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-24	1200	3.75	322	498	12-19	1100	3.40	236	365
12-10	1100	4.25	472	730	2- 4	0530	6.06	1,640	2,540
12-15	0200	3.60	285	441					

* Discharge measurement made on this day.
a No gage-height record.

2400. West Branch Manoa Stream near Honolulu

Location.--Lat 21°19'54", long 157°48'13", on left bank 100 ft upstream from bridge on Waaloa Road, 1.0 mile northeast of Manoa School, and 4.2 miles northeast of Honolulu Post Office.

Drainage area.--1.14 sq mi.

Records available.--May 1913 to January 1921, August 1925 to June 1965.

Gage.--Water-stage recorder (digital) and combination Parshall flume and V-notch weir. Datum of gage is 290.84 ft above mean sea level (Honolulu Board of Water Supply bench mark). Prior to June 17, 1914, staff gage at same site at different datum. June 17, 1914, to Jan. 16, 1921, water-stage recorder at site 150 ft upstream at different datum. Aug. 4, 1925, to Mar. 15, 1928, water-stage recorder at present site at datum 3.35 ft lower.

Average discharge.--46 years (1913-20, 1926-65), 2.42 mgd (3.74 cfs).

Extremes.--Maximum discharge during year, 1,850 mgd (2,860 cfs) Feb. 4 (gage height, 6.16 ft), from rating curve extended above 73 mgd by test on model of station site; minimum, 0.13 mgd (0.20 cfs) Apr. 3-5.

1913-21, 1925-65: Maximum discharge, 2,100 mgd (3,250 cfs) Jan. 16, 1921 (gage height, 10.4 ft, from floodmarks, site and datum then in use), from rating curve extended above 40 mgd; minimum, 0.05 mgd (0.08 cfs) Dec. 16, 18, 1913, Jan. 16-18, Feb. 4, 6, 1915, Mar. 16, 22, 1926.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Occasional small diversion for irrigation above station.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.05	0.13	0.8	6.20
.1	.32	1.1	13.4
.2	.82	1.5	30.0
.3	1.42	1.9	57.0
.7	4.50		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.46	1.95	0.8	0.61	20	1.5	1.33	0.52	0.3	0.21	5.0	4.0
2	.66	1.17	1.0	.52	15	2.0	1.18	.51	.3	.18	10	3.0
3	.50	.87	1.1	.62	5.0	1.8	1.09	1.16	.2	.15	5.0	2.0
4	.46	.82	1.2	.46	3.0	1.5	1.02	*56.1	.2	.13	3.0	1.7
5	.41	2.62	2.3	2.46	10	1.2	1.67	6.31	.2	1.61	2.0	1.5
6	.46	1.36	.7	8.73	5.0	1.1	1.2	2.42	.2	6.18	1.5	1.2
7	.41	1.05	.7	8.01	4.0	1.0	2.5	1.58	.2	2.45	1.5	1.0
8	.60	6.20	.8	2.05	3.0	1.5	1.5	2.16	.3	1.11	2.0	.8
9	.41	1.55	2.1	1.35	2.5	10	1.0	1.31	.2	5.0	1.5	.7
10	.36	.93	1.2	1.02	2.2	25	5.0	1.1	5.0	4.5	1.2	.6
11	2.55	.76	1.1	.87	2.1	10	1.5	1.0	2.0	2.1	1.0	.5
12	1.36	.82	1.4	.75	2.0	20	1.2	.9	1.0	1.0	1.1	.4
13	.66	.99	.7	.68	5.0	10	*1.0	.9	.6	8.0	1.2	.3
14	.71	*1.17	.79	2.40	3.0	5.0	.82	.7	.4	2.0	4.0	.3
15	1.11	1.20	1.32	2.38	2.0	10	1.13	.6	.3	1.17	5.0	.4
16	1.62	2.2	6.06	1.90	1.7	5.0	.76	.5	.3	.89	3.0	.5
17	.87	2.0	2.07	4.65	1.5	3.05	.69	.5	.2	.77	1.5	.5
18	.66	1.2	1.41	7.0	*1.7	2.30	.66	.4	.2	.69	1.0	.61
19	.82	1.2	.94	5.0	5.0	22.2	.60	.4	*.18	.61	1.1	.94
20	.50	1.0	1.80	2.0	4.0	2.79	.57	.4	.17	.55	1.2	.66
21	6.77	.9	1.45	1.5	2.48	2.19	.88	.4	.66	.50	1.0	1.41
22	5.86	1.0	4.10	1.3	2.0	2.10	.61	.5	.31	.51	.9	.94
23	15.3	1.6	2.21	1.1	1.7	3.84	2.48	.5	.86	.70	.8	.63
24	40.2	1.2	1.09	1.0	1.5	1.85	9.04	.5	.98	.50	1.0	1.00
25	12.8	1.3	.81	1.2	1.4	7.20	1.81	.5	.41	.78	.8	.51
26	3.65	1.2	.69	1.0	1.3	3.37	.94	.4	.30	1.66	2.0	.50
27	2.48	1.2	.59	.9	2.0	3.40	1.33	.3	.29	2.26	1.5	1.09
28	1.89	1.1	.57	1.0	1.5	1.90	.73	.4	.29	3.0	*1.3	1.41
29	1.62	1.0	.54	2.0	1.2	1.51	.65	---------	.28	1.5	1.5	.72
30	1.42	.9	*1.17	1.0	1.0	2.07	.59	---------	.50	1.0	1.7	.79
31	1.23	.8	---------	10	---------	1.52	.55	---------	.41	---------	2.5	---------
Total	108.81	43.26	42.71	75.46	113.78	167.89	46.03	82.97	17.74	51.71	67.8	30.61
Mean												
Mgd	3.51	1.40	1.42	2.43	3.79	5.42	1.48	2.96	0.572	1.72	2.19	1.02
Cfs	5.43	2.17	2.20	3.76	5.86	8.39	2.29	4.58	0.885	2.66	3.39	1.58
Ac-ft	334	133	131	232	349	515	141	255	54	159	208	94

Calendar Year 1964: Max 40.2 Min 0.32 Mean mgd 2.62 Mean cfs 4.05 Ac-ft 2,940
Fiscal Year 1964-65: Max 56.1 Min 0.13 Mean mgd 2.33 Mean cfs 3.61 Ac-ft 2,600

Peak discharge (base, 200 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-24	1200	3.83	356	551	12-19	1100	3.82	354	548
12-10	about 1100	3.87	364	563	2- 4	0530	6.16	1,850	2,860
12-15	about 0200	-	about 350	about 540					

* Discharge measurement made on this day.

Note.--No gage-height record Aug. 16 to Sept. 13, Oct. 18 to Nov. 20, Nov. 22 to Dec. 16, Jan. 6-13, Feb. 10 to Mar. 18, Apr. 9-14, Apr. 28 to June 17.

2440. Pukele Stream near Honolulu

Location.--Lat 21°18'35", long 157°47'30", on right bank 200 ft upstream from bridge on Palolo Avenue, 0.6 mile upstream from confluence with Waiomao Stream, and 4.8 miles east of Honolulu Post Office.

Drainage area.--1.18 sq mi.

Records available.--June 1926 to June 1965.

Gage.--Water-stage recorder (digital) and V-notch weir. Datum of gage is 344.78 ft above mean sea level (Honolulu Board of Water Supply bench mark).

Average discharge.--39 years, 1.26 mgd (1.95 cfs).

Extremes.--Maximum discharge during year, 886 mgd (1,370 cfs) Feb. 4 (gage height, 6.58 ft, from floodmarks), from rating curve extended above 62 mgd on basis of slope-area measurement at gage height 6.13 ft; minimum, 0.24 mgd (0.37 cfs) June 29, 30.
1926-65: Maximum discharge, 1,680 mgd (2,600 cfs) Apr. 11, 1930 (gage height, 7.75 ft, from floodmarks), from rating curve extended above 46 mgd by test on model of station site; minimum, 0.05 mgd (0.08 cfs) Oct. 31, 1929.

Remarks.--Records good except those for periods of no gage-height record, which are poor. No diversion above station.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.9	0.18	1.5	4.70
1.0	.43	1.8	10.2
1.1	.87	2.2	21.7
1.2	1.50	2.6	40.5
1.3	2.33		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.34	0.87	0.34	0.37	13.4	0.82	0.9	0.43	0.4	0.31	3.39	0.87
2	.37	.77	.34	.34	10.7	.9	.8	.43	.5	.31	9.15	.62
3	.34	.72	.34	.34	2.15	.9	.9	1.0	.5	.31	3.78	.43
4	.34	.67	.34	.34	1.10	.8	.8	36	.5	.28	3.65	.46
5	.34	.77	.31	.98	7.91	.8	1.2	4.6	.4	.31	2.84	.46
6	.34	.58	.31	4.70	5.00	.7	.9	4.0	.4	2.5	1.98	.46
7	.31	.58	.31	5.15	2.53	1.0	.8	3.2	.4	.34	1.43	.46
8	.31	2.73	.28	.87	1.50	*2.9	1.3	3.9	.3	.34	.9	.43
9	.31	.58	.28	.50	1.16	10.4	.9	3.3	.3	1.3	.6	.43
10	.31	.54	.28	.50	1.04	22	2.6	1.0	.9	2.3	.5	.43
11	.77	.54	.28	.54	1.04	5.0	.8	.8	.8	.43	.5	.40
12	.40	.54	.28	*.54	1.74	7.6	.8	.8	.6	.7	.7	.40
13	.31	.54	.28	.50	9.36	4.8	4.4	.6	.5	16	.5	.37
14	.31	*.58	.28	.54	3.39	3.7	.9	.6	.7	3.0	3.2	.34
15	.31	.50	.28	.62	1.43	4.0	2.8	.5	.7	.50	2.5	.34
16	.34	.54	.67	.50	1.16	4.3	.9	.5	.6	.50	.8	.31
17	.31	.62	.34	1.90	1.10	3.3	.9	.4	.6	.50	.6	.31
18	.31	.50	.31	5.00	1.16	2.5	.8	.4	.5	.50	.5	.28
19	.34	.46	.31	2.53	3.52	26	.8	.4	.5	.46	.5	.28
20	.34	.46	.31	.77	4.04	3.6	.7	.4	.4	.46	.4	.28
21	1.22	.43	.31	.58	3.39	2.8	*.6	.3	.6	.43	.5	.28
22	3.65	.46	9.57	.58	1.29	2.5	.54	.3	.5	.40	.6	.28
23	12.4	.43	2.84	.58	1.22	3.6	.46	.3	.8	.40	.5	.26
24	18.0	.43	.37	.58	1.04	1.7	1.43	.5	1.7	.40	.6	.28
25	10.7	.43	.34	.54	.98	1.4	.77	.4	.5	.37	*.6	.26
26	1.74	.40	.37	.54	.98	2.1	.46	.3	.5	.34	.58	.26
27	.92	.40	.37	.50	.92	2.3	.46	.3	.4	.37	.50	.31
28	.87	.40	.37	.46	1.16	1.0	.46	.3	.3	3.28	.43	.28
29	.87	.37	.37	.43	.87	.9	.46	---------	*.3	2.24	.43	.26
30	.87	.37	.46	.43	.82	.9	.46	---------	.34	1.10	.43	.26
31	.82	.37	---------	2.73	---------	.8	.43	---------	.34	---------	.46	---------
Total	59.11	18.58	21.84	35.48	87.10	126.02	31.43	65.96	16.78	40.68	44.05	11.09
Mean												
Mgd	1.91	0.599	0.728	1.14	2.90	4.06	1.01	2.36	0.541	1.36	1.42	0.370
Cfs	2.96	0.927	1.13	1.76	4.49	6.28	1.56	3.65	0.837	2.10	2.20	0.572
Ac-ft	181	57	67	109	267	387	96	202	51	125	135	34

Calendar Year 1964:	Max	26	Min	0.24	Mean mgd	1.52	Mean cfs	2.35	Ac-ft	1,700
Fiscal Year 1964-65:	Max	36	Min	0.26	Mean mgd	1.53	Mean cfs	2.37	Ac-ft	1,710

Peak discharge (base, 90 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-24	1200	3.83	149	231	12-19	1200	4.20	201	311
9-22	2230	3.45	104	161	2- 4	about 0400	6.58	886	1,370
12-10	1130	5.78	585	905					

* Discharge measurement made on this day.
Note.--No gage-height record Dec. 2-8, Dec. 10 to Jan. 21, Feb. 3 to Mar. 29, Apr. 6, 9, 10, 12-14, May 8-25.

2460. Waiomao Stream near Honolulu

Location.--Lat 21°18'35", long 157°47'10", on left bank 300 ft west of road, 0.8 mile upstream from confluence with Pukele Stream, and 5 miles east of Honolulu Post Office.

Drainage area.--1.04 sq mi.

Records available.--April to December 1911, May to December 1912, June 1926 to June 1965. Prior to July 1963, published as "above Pukele Stream, near Honolulu."

Gage.--Water-stage recorder and V-notch weir. Datum of gage is 373.66 ft above mean sea level (Honolulu Board of Water Supply bench mark). Apr. 12, 1911, to Dec. 31, 1912, staff gage at site 0.5 mile downstream at different datum.

Average discharge.--39 years (1926-65), 1.17 mgd (1.81 cfs).

Extremes.--Maximum discharge during year, 468 mgd (724 cfs) Feb. 4 (gage height, 5.28 ft), from rating curve extended above 90 mgd on basis of slope-area measurement at gage height 4.74 ft; minimum, 0.07 mgd (0.11 cfs) July 10, 11.
1911-12, 1926-65: Maximum discharge, 1,000 mgd (1,550 cfs) Apr. 11, 1930 (gage height, 6.27 ft), from rating curve extended above 65 mgd by test on model of station site; no flow at times.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Honolulu Board of Water Supply diverts ground water from tunnels in drainage area.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.8	0.05	1.5	3.70
.9	.21	1.8	8.40
1.0	.47	2.1	15.5
1.1	.83	2.5	30.0
1.3	1.86	3.0	58.0

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.15	0.73	0.21	0.3	12.2	0.44	0.28	0.23	0.15	0.28	3.11	1.33
2	.25	.81	.85	.2	10.0	.83	.23	.23	.25	.21	8.99	.99
3	.19	.33	.88	.3	2.49	.60	.21	1.48	.28	.19	4.16	.44
4	.15	.25	.17	.5	1.48	.44	.19	41.9	.19	.34	4.03	.47
5	.12	1.01	.15	1.7	6.95	.35	.60	7.49	.17	.98	3.21	.35
6	.13	.60	.15	2.5	4.50	.31	.57	4.22	.17	2.42	2.02	.31
7	.12	.33	.13	3.8	2.33	.28	1.58	2.26	.15	1.01	1.36	.31
8	.12	1.8	.10	1.4	1.42	.71	.88	4.24	.15	.47	1.98	.25
9	.12	.5	.17	.7	.93	18.9	.38	2.65	.15	2.03	1.27	.23
10	.09	.6	.13	.6	.79	32.4	3.07	1.48	1.31	2.39	.64	.21
11	1.15	.4	.12	.5	.60	7.43	.93	1.17	.97	.72	.47	.21
12	1.39	*.28	.12	*.31	1.86	7.99	.53	.93	.38	.47	.57	.23
13	.38	.31	.10	.25	8.01	6.29	.96	.72	.28	12.2	.60	.23
14	.31	.33	.10	.55	3.86	2.10	.57	.53	.53	2.33	4.61	.21
15	.35	.31	.12	1.50	1.21	2.75	*.79	.44	.53	.93	5.18	.25
16	.77	.75	2.02	.79	.75	4.15	.38	.41	.47	.60	1.58	.21
17	.44	1.38	1.12	3.52	.57	2.41	.28	.38	.41	.47	1.07	.19
18	.25	.44	.50	8.93	1.18	1.17	.25	.33	.4	.35	.68	.19
19	.33	.35	.28	4.06	4.51	16.2	.21	.31	.3	.31	.57	.23
20	.25	.33	.57	1.36	4.91	2.10	.17	.28	.2	.28	.60	.19
21	2.77	.28	.28	.97	3.11	1.21	.48	.25	.5	.25	.68	.21
22	5.03	.35	13.8	.57	1.17	1.17	.28	.25	.4	.23	.64	.50
23	11.8	.88	4.20	.53	1.61	2.32	.21	.25	.9	.23	.38	.25
24	16.7	.33	.93	.38	*.97	1.21	2.51	.33	1.6	.21	.5	.35
25	17.5	.25	.50	.35	.72	.75	3.64	.25	.5	.19	*.31	.28
26	2.10	.21	.23	.33	.53	.75	.47	.21	*.31	.21	.75	.23
27	1.17	.85	.25	.28	.83	.64	.50	.19	.25	.76	.69	.61
28	.72	1.07	.23	.31	.83	.53	.35	.17	.21	4.18	.47	.41
29	.53	.33	.21	.53	.53	.38	.31	---------	.19	2.79	.38	.28
30	.72	.23	.8	.33	.41	.47	.28	---------	.36	1.49	.38	.25
31	.41	.21	---------	3.57	---------	.35	.28	---------	.65	---------	.47	---------
Total	66.51	16.83	29.42	41.92	81.26	117.63	22.37	73.58	13.31	39.52	52.35	10.40
Mean												
Mgd	2.15	0.543	0.981	1.35	2.71	3.79	0.722	2.63	0.429	1.32	1.69	0.347
Cfs	3.33	0.840	1.52	2.09	4.19	5.86	1.12	4.07	0.664	2.04	2.61	0.537
Ac-ft	204	52	90	129	249	361	69	226	41	121	161	32

Calendar Year 1964:	Max	32.4	Min	0.06	Mean mgd	1.48	Mean cfs	2.29	Ac-ft	1,660
Fiscal Year 1964-65:	Max	41.9	Min	0.09	Mean mgd	1.55	Mean cfs	2.40	Ac-ft	1,740

Peak discharge (base, 70 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-25	0300	4.25	206	319	12-19	1230	3.75	130	201
9-22	2130	4.32	219	339	2- 4	0500	5.28	468	724
12-10	1100	4.76	313	484	4-13	0930	3.29	81.1	125

* Discharge measurement made on this day.
Note.--No gage-height record Aug. 8-11, Sept. 30 to Oct. 11, Mar. 18-25, May 24.

2470. Palolo Stream near Honolulu

Location.--Lat 21°17'35", long 157°48'25", on left bank 250 ft downstream from bridge on Palolo Avenue and 3.9 miles east of Honolulu Post Office.

Drainage area.--3.63 sq mi.

Records available.--April 1952 to June 1965. See also Note below.

Gage.--Water-stage recorder (digital) and concrete control. Altitude of gage is 95 ft (from topographic map).

Average discharge.--13 years, 3.41 mgd (5.28 cfs).

Extremes.--Maximum discharge during year, 1,300 mgd (2,010 cfs) Feb. 4 (gage height, 4.42 ft), from rating curve extended above 86 mgd as explained below; minimum, 0.50 mgd (0.77 cfs) July 1, 4, 5, 8-11.
1952-65: Maximum discharge, 2,100 mgd (3,250 cfs) Mar. 5, 1958 (gage height, 5.33 ft), from rating curve extended above 86 mgd on basis of slope-conveyance study and slope-area measurements at gage heights 3.92 and 4.13 ft; minimum, 0.01 mgd (0.02 cfs) June 25, 1958.

Remarks.--Records fair except those for period of no gage-height record, which are poor.

Note.--Published records for high-water periods in fiscal years 1953, 1955-60 have been found to be in error; revised records are on file in the district office and will be published in the next water-supply paper.

Rating table (gage height, in feet, and discharge, in million gallons a day)

1.4	0.22	1.9	15.6
1.5	.55	2.0	28.0
1.6	1.32	2.1	44.0
1.7	3.60	2.2	69.0
1.8	8.00	2.4	140

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.57	1.90	1.17	0.85	31.2	2.30	2.30	1.90	0.7	0.78	8.55	4.00
2	.86	1.60	1.27	.72	17.7	2.80	2.20	2.30	.8	.66	40.8	3.20
3	.62	1.01	1.34	.78	4.40	2.80	2.29	3.20	.8	.66	12.3	2.10
4	.58	.93	1.13	.93	2.30	2.30	2.10	110	.8	.72	14.7	2.50
5	.56	1.75	1.12	4.00	12.3	2.30	3.42	22	.7	1.75	8.60	2.30
6	.58	1.01	1.15	9.30	6.00	2.30	2.29	17	.7	5.20	5.20	2.10
7	.59	.78	1.11	14.7	4.00	3.20	2.10	9.0	.7	1.90	2.30	2.30
8	.57	4.80	1.11	2.50	2.10	7.00	3.42	16	.7	1.10	2.50	2.30
9	.56	.93	1.28	1.32	1.32	42.4	2.29	9.6	.7	3.60	1.60	2.10
10	.54	1.01	.82	1.10	1.20	72.4	5.11	3.3	2.4	4.80	1.20	2.10
11	2.43	.93	.90	1.01	1.10	28.0	2.18	2.4	2.2	1.90	1.20	1.75
12	2.29	*.85	1.01	*.85	2.80	31.5	2.00	2.0	.9	1.60	1.90	1.01
13	.78	.86	.79	.86	10.7	27.1	21.3	1.3	.8	44.0	1.20	1.01
14	.72	1.03	.84	1.28	4.00	13.7	*2.50	1.0	1.0	7.71	8.00	.85
15	.84	1.12	.78	3.20	1.32	14.3	7.00	1.0	1.0	2.42	7.00	.93
16	1.36	1.35	5.23	1.54	1.10	20.0	2.80	.9	.9	1.70	1.75	.72
17	1.01	2.40	2.68	7.64	1.10	10.1	2.80	.9	.8	1.27	1.01	.78
18	.74	.86	1.10	14.9	1.32	5.51	2.80	.8	.7	1.10	.85	.78
19	1.08	.85	.72	9.60	4.80	54.3	2.50	.8	.7	1.05	.93	.93
20	.82	.92	1.03	2.68	5.20	12.2	2.10	.8	.6	1.23	.85	.85
21	9.91	.83	.80	2.15	5.20	6.80	2.30	.7	.9	1.83	.93	.93
22	32.6	1.22	22.4	1.68	3.20	5.87	1.90	.7	.7	1.69	1.10	1.32
23	49.1	1.61	10.7	1.78	3.60	11.8	1.90	.7	*1.8	1.68	.93	.93
24	42.0	1.02	1.32	1.63	*2.80	4.14	5.20	.8	4.00	1.60	1.01	1.32
25	32.8	.98	.85	1.68	2.30	3.88	4.40	.7	.85	1.58	1.10	.85
26	6.50	1.01	.72	1.79	2.30	4.60	1.90	.7	.66	1.79	*1.90	1.10
27	2.50	1.64	.72	1.69	2.80	4.63	2.10	.7	.60	3.23	1.90	1.60
28	2.10	2.30	.78	2.14	3.60	3.24	2.10	.7	.60	9.21	1.46	1.32
29	1.90	1.33	.93	2.04	2.30	2.41	2.10	---------	.60	5.86	1.60	1.01
30	2.30	1.19	1.60	1.70	2.30	2.35	2.10	---------	4.80	3.77	1.60	1.20
31	1.60	1.19	---------	8.87	---------	2.30	1.90	---------	1.60	---------	2.10	---------
Total	201.41	41.21	67.40	106.91	146.36	408.53	103.40	211.90	35.71	117.39	138.07	46.19
Mean												
Mgd	6.50	1.33	2.25	3.45	4.88	13.2	3.34	7.57	1.15	3.91	4.45	1.54
Cfs	10.1	2.06	3.48	5.34	7.55	20.4	5.17	11.7	1.78	6.05	6.89	2.38
Ac-ft	618	126	207	328	449	1250	317	650	110	360	424	142

Calendar Year 1964: Max 72.4 Min 0.50 Mean mgd 4.06 Mean cfs 6.28 Ac-ft 4560
Fiscal Year 1964-65: Max 110 Min 0.54 Mean mgd 4.45 Mean cfs 6.89 Ac-ft 4980

Peak discharge (base, 220 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-25	0400	2.68	266	412	12-19	1130	2.65	252	390
9-22	2230	2.75	298	461	2- 4	0530	4.42	1,300	2,010
10-18	1830	2.70	275	425	4-13	0930	2.72	284	439
12-10	1130	3.82	874	1,350	5- 2	1930	2.60	230	356

* Discharge measurement made on this day.
Note.--No gage-height record Feb. 4 to Mar. 23.

2500. Maunawili ditch near Waimanalo

Location.--Lat 21°20'45", long 157°45'10", on left bank 80 ft downstream from Aniani Nui Ridge tunnel and 3.5 miles west of Waimanalo Post Office.

Records available.--March 1954 to June 1965.

Gage.--Water-stage recorder (digital since Aug. 11) and sharp-crested weir. Altitude of gage is 390 ft (from topographic map).

Average discharge.--11 years, 1.74 mgd (2.69 cfs).

Extremes.--1954-65: Maximum daily discharge, 7.0 mgd (10.8 cfs) Mar. 5, 1958; no flow at times.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Ditch diverts from headwaters of Maunawili and Makawao Streams for irrigation in vicinity of Waimanalo.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.6	.8	1.4	1.56	1.03	0	0.65	0.37	0.43	0	0.72	1.2
2	1.6	.8	1.4	1.69	.88	0	.65	.37	.44	.21	2.06	1.1
3	1.6	.8	1.4	1.82	.85	0	.65	.47	.43	.47	.34	1.1
4	1.6	.8	1.4	1.82	.75	.39	.65	1.33	.43	.42	.49	1.0
5	1.7	.8	1.4	1.83	.75	1.05	.68	.24	.42	.39	.19	1.0
6	1.7	.7	1.6	1.85	.68	1.05	.68	.15	.41	.42	.11	1.0
7	1.7	.7	1.5	1.96	.63	.78	.79	.51	.40	.40	.1	1.1
8	1.6	.8	1.5	1.91	.60	.78	.65	.51	.40	.38	.1	1.0
9	1.5	.7	1.6	1.85	.57	1.44	.62	.28	.44	.84	.1	1.0
10	1.5	*.7	1.7	1.81	.57	2.08	.77	.10	.68	1.55	.1	1.0
11	1.7	.7	1.6	1.77	.88	1.01	.58	.05	.56	1.49	.1	1.0
12	1.6	.7	1.5	1.72	1.12	1.00	.64	.05	.52	1.47	.2	1.0
13	1.6	.7	1.6	1.70	** .88	.94	.66	0	.53	2.60	.5	1.2
14	1.6	.7	1.5	1.61	1.12	*.91	.57	0	.51	1.25	.5	1.1
15	1.6	.8	1.5	1.50	1.10	.88	.55	0	.50	1.19	1.2	1.1
16	1.6	.9	1.6	1.55	1.10	1.08	.52	0	.51	1.17	1.1	1.1
17	1.6	1.0	1.5	1.60	.45	.85	.50	0	.53	1.13	1.1	1.6
18	1.6	1.4	1.5	1.68	.69	.84	.50	*0	.53	1.10	1.1	*2.75
19	1.6	1.2	1.5	1.39	1.76	2.00	.50	.2	.53	1.08	1.1	2.76
20	1.6	1.2	1.5	1.34	.85	.78	.50	.49	.53	1.05	1.1	2.66
21	1.7	1.2	1.4	1.29	.11	.76	.52	.47	.61	1.01	1.1	2.82
22	1.8	1.2	1.5	1.25	.08	.70	.47	.45	.45	.99	1.0	2.54
23	1.8	1.4	1.4	1.22	.16	.37	.46	.45	.35	.95	1.0	2.66
24	1.9	1.3	1.4	1.17	.10	.23	.96	.48	.35	.91	1.0	2.83
25	2.0	1.3	1.4	1.15	.08	.23	.42	.46	.34	.89	1.0	2.66
26	1.6	1.3	1.4	1.20	.07	.23	.40	.45	.33	*.90	1.0	2.64
27	1.3	1.3	1.4	1.09	.07	.23	.46	.44	.32	.96	1.1	2.68
28	1.0	1.5	1.5	1.20	.06	.36	.40	.43	.32	.91	1.0	2.60
29	.8	1.4	*1.4	1.25	.04	.65	.38	---------	.32	.87	1.0	2.55
30	.8	1.4	1.54	1.00	0	.65	.37	---------	.81	.74	1.0	2.46
31	.8	1.4	---------	1.18	---------	.65	.37	---------	.08	---------	1.1	---------
Total	47.7	31.6	44.54	46.96	18.03	22.92	17.52	8.75	14.01	27.74	23.61	53.21
Mean												
Mgd	1.54	1.02	1.48	1.51	0.601	0.739	0.565	0.312	0.452	0.925	0.762	1.77
Cfs	2.38	1.58	2.29	2.34	0.930	1.14	0.874	0.483	0.699	1.43	1.18	2.74
Ac-ft	146	97	137	144	55	70	54	27	43	85	72	163

Calendar Year 1964:	Max	2.11	Min	0	Mean mgd	1.33	Mean cfs	2.06	Ac-ft	1490		
Fiscal Year 1964-65:	Max	2.83	Min	0	Mean mgd	0.977	Mean cfs	1.51	Ac-ft	1090		

* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
Note.--No gage-height record July 1 to Sept. 29, Feb. 19, May 7 to June 17.

2540. Makawao Stream near Kailua

Location.--Lat 21°21'50", long 157°46'05", on left bank 650 ft upstream from mouth, 2.7 miles southwest of Kailua, and 4.3 miles southeast of Kaneohe Courthouse.

Drainage area.--2.04 sq mi.

Records available.--November 1912 to June 1916, January 1958 to June 1965.

Gage.--Water-stage recorder (digital) and concrete control. Altitude of gage is 80 ft (from topographic map). Prior to Jan. 1, 1958, staff gage at sites about 200 ft upstream at different datums.

Average discharge.--10 years (1913-16, 1958-65), 3.47 mgd (5.37 cfs).

Extremes.--Maximum discharge during year, 3,880 mgd (6,000 cfs) Feb. 4 (gage height, 12.41 ft), from rating curve extended above 310 mgd on basis of slope-area measurement of peak flow; minimum, 0.28 mgd (0.43 cfs) Sept. 8-12, 14, 16-20, 22, 23.
1912-16, 1958-65: Maximum discharge, that of Feb. 4, 1965; minimum, 0.28 mgd (0.43 cfs) Sept. 8-12, 14, 16-20, 22, 23, 1964.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Maunawili ditch (see preceding page) diverts 1.5 miles above station.

Rating tables (gage height, in feet, and discharge, in million gallons a day)

July 1-24		July 25 to June 30			
1.4	0.72	1.3	0.28	2.5	24.0
1.5	1.30	1.4	.74	3.0	50.0
1.7	2.98	1.5	1.40	3.5	87.0
1.8	4.23	1.6	2.38	4.0	135
		1.8	5.00	4.5	195
		2.1	11.1		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.43	1.7	1.11	1.58	3.35	4.30	4.01	3.35	4.15	4.86	13	6.54
2	1.48	1.6	1.11	1.49	4.58	4.58	3.87	3.23	4.15	4.58	40	5.86
3	1.44	1.6	.98	1.25	4.44	4.30	3.87	*5.51	4.01	8.80	23	5.68
4	1.44	1.7	.98	1.25	3.4	3.87	3.59	*1.45	3.87	4.72	19.0	5.51
5	1.46	1.8	.91	1.33	4.1	3.11	4.86	14.7	3.87	4.58	12.2	5.00
6	1.51	1.4	.79	1.40	3.9	3.23	4.44	9.26	3.87	5.51	8.80	5.00
7	1.50	1.4	.62	2.26	3.6	3.35	7.96	13.0	3.73	4.44	7.76	4.86
8	1.47	2.7	32	1.75	3.4	3.35	4.58	17.4	3.73	4.30	7.8	4.72
9	1.46	1.6	.49	1.58	3.2	22.8	4.01	15.3	3.23	4.15	7.3	4.58
10	1.35	1.5	32	1.49	3.1	45.8	9.26	9.03	5.17	2.98	7.0	4.15
11	1.98	1.4	.44	1.49	3.1	11.9	4.15	7.55	7.76	2.86	7.1	3.87
12	1.65	1.4	.44	1.49	3.1	10.9	4.86	6.92	3.59	2.86	7.1	3.87
13	1.39	1.4	.58	1.40	*4.30	7.55	6.37	6.37	3.23	32.6	7.2	3.87
14	1.28	1.4	.44	1.49	5.68	*6.03	4.15	6.03	3.11	7.13	8.6	3.87
15	1.39	1.4	.44	1.58	3.47	6.71	4.44	5.68	2.98	5.34	9.6	3.87
16	1.45	1.5	.53	1.49	3.35	17.1	3.73	5.51	2.98	5.00	8.0	3.73
17	1.34	*1.6	.49	1.75	3.59	7.96	3.59	5.17	3.35	4.72	7.96	*3.23
18	1.38	1.96	.49	13.5	4.15	6.92	3.59	*4.86	4.01	4.58	7.96	2.86
19	1.45	1.86	.44	6.92	4.44	5.32	3.35	4.58	4.01	4.72	7.96	2.50
20	1.39	1.75	.44	3.11	7.76	10.4	3.35	4.30	4.01	4.44	7.76	2.38
21	1.85	1.58	.40	2.74	6.71	8.80	4.15	4.15	5.00	4.44	7.76	2.62
22	2.06	1.58	2.06	2.50	5.68	8.80	3.35	4.01	4.30	3.6	7.76	2.62
23	2.48	1.58	1.58	2.26	7.96	10.9	3.23	4.01	4.58	3.6	6.3	2.26
24	3.5	1.49	.49	2.26	5.86	6.92	18.7	4.01	4.44	3.7	6.6	2.86
25	13	1.49	.44	2.26	5.17	6.20	5.86	3.87	4.15	3.5	6.0	2.26
26	2.8	1.04	.49	1.96	4.58	5.86	4.01	3.73	4.01	*4.30	6.2	2.26
27	1.8	1.11	.44	1.96	4.86	5.51	5.68	3.87	3.87	6.37	6.20	2.26
28	1.7	1.58	.40	2.06	4.58	4.86	3.73	4.15	3.87	8.80	6.37	2.16
29	1.6	1.40	*1.04	2.38	4.44	4.30	3.59	---------	3.87	8.38	6.03	2.06
30	1.6	1.04	1.58	2.38	4.30	4.15	3.47	---------	22.0	5.51	5.86	2.16
31	1.6	.98	---------	2.62	---------	4.01	3.35	---------	6.71	---------	6.20	---------
Total	63.23	47.54	21.28	74.98	134.15	307.67	151.15	324.55	145.61	175.37	296.38	109.47
Mean												
Mgd	2.04	1.53	0.709	2.42	4.47	9.92	4.88	11.6	4.70	5.85	9.56	3.65
Cfs	3.14	2.37	1.10	3.74	6.92	15.3	7.55	17.9	7.27	9.05	14.8	5.65
Ac-ft	194	146	65	230	412	944	464	996	447	538	910	336

Calendar Year 1964: Max 5.32 Min 0.32 Mean mgd 3.29 Mean cfs 5.09 Ac-ft 3,700
Fiscal Year 1964-65: Max 1.45 Min 0.32 Mean mgd 5.07 Mean cfs 7.84 Ac-ft 5,680

Peak discharge (base, 200 mgd, revised)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-25	-	5.63	376	582	2- 4	0500	12.41	3,880	6,000
12-10	1430	5.98	446	690	3-30	2200	7.78	924	1,430
12-19	1130	6.68	610	944	4-13	1000	5.48	347	537
1-24	2100	6.21	496	767	5- 2	about 1200	9.66	1,710	2,650

* Discharge measurement made on this day.
Note.--No gage-height record July 24 to Aug. 17, Nov. 4-12, Apr. 22-25, May 1-3, 8-16, 23-26.

2750. Haiku Stream near Heeia

Location.--Lat 21°24'45", long 157°49'35", on left bank 1.7 miles west of Kaneohe Post Office and 1.8 miles southwest of Heeia.
Drainage area.--0.97 sq mi.
Records available.--January 1914 to October 1919, July 1939 to June 1965. See also Note below.
Gage.--Water-stage recorder. Datum of gage is 271.9 ft above mean sea level (levels by City and County of Honolulu). Prior to Apr. 28, 1914, staff gage and Apr. 28, 1914, to Oct. 25, 1919, water-stage recorder, at same site at different datums.
Average discharge.--22 years (1943-65), 1.36 mgd (2.10 cfs).
Extremes.--Maximum discharge during year, 3,710 mgd (5,740 cfs) May 2 (gage height, 7.94 ft), from rating curve extended above 37 mgd on basis of slope-area measurements at gage heights 3.87, 3.88, and 7.94 ft; minimum, 0.82 mgd (1.27 cfs) Feb. 2
1914-19, 1939-65: Maximum discharge, that of May 2, 1965; minimum, 0.13 mgd (0.20 cfs) July 20, 1957, Sept. 17, 1961.
Revisions.--The figures of maximum discharge for some fiscal years have been revised, as shown in the following table. They supersede those published in Surface Water Records of Hawaii and other Pacific Areas for the years indicated.

Fiscal year	Date	Discharge		Gage height (feet)
		Mgd	Cfs	
1961	Dec. 30, 1960	826	1,280	3.87
1962	Mar. 12, 1962	310	480	3.14
1963	Apr. 15, 1963	970	1,500	4.05
1964	Mar. 22, 1964	467	723	3.41

Remarks.--Records good except those for periods of no gage-height record, which are poor. Honolulu Board of Water Supply has diverted water from tunnel in drainage area since 1943.
Note.--Published records for high-water periods in fiscal years 1940-45, 1947-53, 1955-60 have been found to be in error; revised records are on file in the district office and will be published in the next water-supply paper.
Revisions.--Revised figures of discharge for some peak discharges in the fiscal years 1962-64, superseding those published in Surface Water Records of Hawaii and other Pacific Areas (1962-64), are given herewith:

Revised peak discharge.--1961-62: Nov. 1 (1430) 205 mgd (317 cfs), 2.90 ft; Mar. 12 (0800) 310 mgd (480 cfs), 3.14 ft.
1962-63: Mar. 6 (0830) 194 mgd (300 cfs), 2.87 ft; Mar. 26 (1100) 119 mgd (184 cfs), 2.63 ft; Apr. 3 (2400) 254 mgd (393 cfs), 3.02 ft; Apr. 15 (1430) 970 mgd (1,500 cfs), 4.05 ft; May 14 (1330) 906 mgd (1,400 cfs), 3.97 ft.
1963-64: Oct. 4 (1930) 406 mgd (628 cfs), 3.31 ft; Dec. 12 (0615) 263 mgd (407 cfs), 3.04 ft; Mar. 22 (1445) 467 mgd (723 cfs), 3.41 ft.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.93	1.17	1.05	0.93	2.37	1.1	1.3	1.1	0.9	0.93	3.77	1.5
2	.93	1.17	1.05	.93	4.56	1.1	1.3	.82	.9	.88	*401	1.4
3	.93	1.17	1.05	.93	1.90	1.1	1.2	.99	1.0	.99	29.8	1.4
4	.93	1.23	1.05	.93	2.08	1.15	1.2	*49.2	.9	.93	28.6	1.4
5	.93	1.30	1.05	.99	2.37	1.11	1.5	6.40	.9	.93	6.72	1.4
6	.93	1.30	1.05	1.05	1.90	1.11	1.3	3.55	.9	3.44	4.31	1.3
7	.93	1.30	1.0	2.57	1.61	1.10	1.3	2.57	.9	1.52	3.33	1.3
8	.93	2.79	1.0	1.37	1.61	1.11	1.2	*3.22	1.0	1.17	16.7	1.3
9	.93	1.80	1.0	1.11	1.52	20.4	1.2	8.60	1.1	1.23	4.68	1.3
10	.99	1.52	1.0	1.05	1.37	18.0	3.0	2.53	1.1	1.23	3.19	1.3
11	1.05	1.37	1.0	1.05	1.30	5.35	1.5	2.05	1.1	1.23	2.56	1.26
12	1.05	1.30	1.0	.99	*1.30	4.42	1.3	1.81	1.1	1.11	2.28	1.24
13	1.05	1.37	1.0	.99	2.6	5.35	1.9	1.65	1.06	1.80	2.07	1.22
14	1.05	1.37	1.0	1.05	5.2	2.6	1.6	1.3	1.03	1.52	9.03	*1.23
15	1.05	1.37	1.0	1.11	1.9	4.0	1.4	1.1	1.01	1.30	4.74	1.20
16	1.05	1.37	1.1	1.05	1.5	*3.0	1.3	1.0	.93	1.17	3.00	1.17
17	1.05	1.45	1.0	1.61	1.2	1.5	1.3	1.0	.93	1.11	2.0	1.16
18	1.05	1.37	1.0	20.4	1.2	1.2	1.2	1.0	.93	1.11	1.7	1.14
19	1.05	1.30	1.0	4.71	2.3	6.4	1.2	1.0	.93	1.11	1.5	1.15
20	1.05	1.17	1.0	1.80	3.8	1.6	1.4	1.0	.88	*1.11	1.5	1.13
21	1.30	1.17	1.0	1.37	1.9	1.1	1.3	1.0	1.30	1.13	1.5	1.14
22	1.37	1.11	2.5	1.17	1.4	1.3	1.3	1.0	.93	1.15	1.4	1.28
23	5.18	1.11	1.2	1.11	1.5	1.6	4.0	1.0	.93	1.21	1.4	1.13
24	2.90	1.11	2.0	1.11	1.2	1.4	2.6	1.0	.88	1.16	1.3	1.15
25	16.8	1.11	*1.1	1.05	1.1	1.6	1.3	.9	.88	1.16	1.3	1.13
26	2.46	1.11	1.0	1.11	1.2	1.4	1.2	.9	.88	1.16	1.3	1.14
27	1.61	1.11	.9	1.05	1.2	1.4	1.2	.9	.88	1.25	1.3	1.11
28	1.37	1.11	.9	1.05	1.3	1.2	1.1	.9	.88	2.04	1.3	1.11
29	1.30	1.05	.93	1.11	1.2	1.2	1.1	---------	.88	2.66	1.2	1.07
30	1.23	1.05	.93	1.11	1.1	1.3	1.1	---------	1.30	1.66	1.2	1.07
31	*1.17	1.05	---------	1.17	---------	1.2	1.1	---------	1.05	---------	1.2	---------
Total	56.55	40.28	32.86	59.03	56.69	97.40	45.9	99.49	30.29	40.40	546.88	36.83
Mean												
Mgd	1.82	1.30	1.10	1.90	1.89	3.14	1.48	3.55	0.977	1.35	17.6	1.23
Cfs	2.82	2.01	1.70	2.94	2.92	4.86	2.29	5.49	1.51	2.09	27.2	1.90
Ac-ft	174	124	101	181	174	299	141	305	93	124	1.680	113

Calendar Year 1964: Max 20.4 Min 0.88 Mean mgd 1.63 Mean cfs 2.52 Ac-ft 1.830
Fiscal Year 1964-65: Max 401 Min 0.82 Mean mgd 3.13 Mean cfs 4.84 Ac-ft 3.510

* Discharge measurement made on this day.
Note.--No gage-height record Sept. 7-28, Nov. 13 to Dec. 3, Dec. 14 to Feb. 1, Feb. 14 to Mar. 12, May 17 to June 10.

Peak discharge (base, 220 mgd)

Date	Time	Gage height	Discharge		Date	Time	Gage height	Discharge	
			Mgd	Cfs				Mgd	Cfs
7-25	0300	2.97	233	361	5- 2	1330	7.94	3,710	5,740
11-13	2300	3.43	481	744	5- 4	1900	3.76	738	1,140
12-10	1500	3.16	320	495	5- 8	1230	3.15	315	487
2- 4	0430	3.88	834	1,290	5-14	1230	2.94	221	342
2- 9	0300	3.21	346	535					

2780. Iolekaa Stream mauka near Heeia

Location.--Lat 21°25'15", long 157°49'50", on left bank 0.7 mile upstream from confluence with Haiku Stream, 1.5 miles southwest of Heeia, and 1.8 miles west of Kaneohe Post Office.

Drainage area.--0.28 sq mi.

Records available.--March 1940 to June 1965.

Gage.--Water-stage recorder (digital) and concrete control. Datum of gage is 320 ft above mean sea level (transit levels by U.S. Navy).

Average discharge.--24 years (1940-42, 1943-65), 0.421 mgd (0.651 cfs).

Extremes.--Maximum discharge during year, 212 mgd (328 cfs) May 2 (gage height, 3.74 ft), from rating curve extended above 2.1 mgd by test on model of station site; minimum, 0.12 mgd (0.19 cfs) Aug. 14.
1940-65: Maximum discharge, that of May 2, 1965; minimum, not determined; minimum daily, 0.10 mgd (0.16 cfs) Oct. 31 to Nov. 9, Nov. 24, 27, 1946.

Remarks.--Records good except those for period of no gage-height record, which are poor. No diversion above station.

Rating tables (gage height, in feet, and discharge, in million gallons a day)

July 1 to May 1

0.5	0.20	0.9	1.75
.6	.36	1.0	2.70
.7	.64	1.1	4.00
.8	1.06	1.3	8.00

May 2 to June 30

0.6	0.55	1.2	5.80
.7	.86	1.4	10.5
.8	1.27	1.7	21.2
.9	1.88	2.0	38.3
1.0	2.76	2.5	77.0
1.1	4.00		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.30	0.38	0.34	0.30	0.69	0.32	0.5	0.34	0.38	0.43	0.99	0.64
2	.30	.38	.34	.30	1.51	.32	.5	.35	.39	.43	43.0	.61
3	.30	.38	.34	.28	.67	.31	.4	5.99	.39	.58	7.12	.61
4	.30	.36	.34	.26	.81	.32	.4	6.66	.38	.51	3.85	.61
5	.30	.38	.36	.26	.96	.31	.6	1.37	.38	.57	1.60	.61
6	.31	.36	.34	.46	.64	.30	.5	1.18	.38	1.93	1.01	.61
7	.32	.36	.34	1.29	.54	.30	.5	.83	.38	.65	.83	.61
8	.31	1.22	.34	.37	.51	.30	.4	3.26	.39	.52	4.99	.61
9	.32	.49	.36	.31	.49	4.43	.4	1.45	.41	.52	1.54	.61
10	.32	.41	.34	.30	.43	3.82	.9	.73	.41	.52	.94	.61
11	.61	.41	.34	.30	.43	1.70	.5	.58	.41	.53	.79	.61
12	.38	.38	.36	.28	*.43	1.71	.5	.52	.41	.50	.72	.61
13	.31	.41	.34	.28	.90	2.19	.6	.49	.41	.73	.66	.61
14	.32	*.38	.34	.35	2.18	.81	.5	.47	.40	.59	2.45	*.58
15	.32	.36	.36	.34	.60	1.2	.5	*.45	.41	.53	1.60	.58
16	.33	.41	.38	.30	.43	.9	.4	.42	.41	.50	.94	.58
17	.32	.38	.36	.92	.38	.5	.4	.41	.41	.48	.76	.58
18	.32	.36	.36	4.11	.38	.4	*.43	.41	.41	.46	.72	.58
19	.33	.36	.36	1.39	.89	2.1	.43	.41	.41	.46	.66	.58
20	.32	.36	.36	.59	1.23	.5	.46	.41	.41	*.46	.66	.58
21	.60	.36	.36	.44	.63	.4	.43	.41	.58	.44	.66	.58
22	.39	.36	.96	.37	.47	.5	.43	.41	.41	.44	.64	.64
23	2.07	.36	.38	.35	.51	.6	1.16	.41	.41	.47	.64	.58
24	.73	.36	.79	.34	.39	.5	.75	.41	.41	.43	.61	.58
25	4.50	.36	*.37	.32	.36	.6	.44	.39	.41	.43	.61	.58
26	.86	.36	.33	.33	.37	.5	.41	.38	.41	.43	.61	.58
27	.54	.38	.31	.32	.39	.5	.38	.38	.41	.48	.61	.58
28	.46	.36	.30	.32	.42	.4	.37	.38	.41	.94	.61	.58
29	.41	.36	.30	.33	.34	.4	.36	---------	.41	.80	.61	.58
30	.41	.34	.30	.31	.33	.5	.35	---------	.59	.50	.61	.58
31	.38	.34	---------	.35	---------	.4	.34	---------	.47	---------	.61	---------
Total	17.99	12.47	11.40	16.77	19.31	28.04	15.24	29.90	12.90	17.26	82.65	17.88
Mean												
Mgd	0.580	0.402	0.380	0.541	0.644	0.905	0.492	1.07	0.416	0.575	2.67	0.596
Cfs	0.897	0.622	0.588	0.837	0.996	1.40	0.761	1.66	0.644	0.890	4.13	0.922
Ac-ft	55	38	35	51	59	86	47	92	40	53	254	55

Calendar Year 1964: Max 4.50 Min 0.26 Mean mgd 0.537 Mean cfs 0.831 Ac-ft 602
Fiscal Year 1964-65: Max 43.0 Min 0.26 Mean mgd 0.772 Mean cfs 1.19 Ac-ft 865

* Discharge measurement made on this day.
Note.--No gage-height record Dec. 15 to Jan. 17.

Peak discharge (base, 15 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-25	0630	1.56	15.6	24.1	2- 8	2030	1.93	33.8	52.3
10-18	1630	1.75	23.6	36.5	5- 2	1330	3.74	212	328
12- 9	1600	1.98	37.0	57.2	5- 4	1900	2.06	42.6	65.9
1-23	2130	1.61	17.4	26.9	5- 8	1230	1.96	35.7	55.2
2- 3	2000	2.64	88.2	136	5-14	2130	1.58	16.3	25.2

2830. Kahaluu Stream near Heeia

Location.--Lat 21°26'20", long 157°51'20", on left bank 40 ft upstream from intake of Libby ditch, 0.5 mile upstream from forest-reserve boundary, and 3.0 miles northwest of Heeia.

Drainage area.--0.28 sq mi.

Records available.--October 1935 to June 1965.

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 357.52 ft above mean sea level (levels by Wright, Harvey & Wright).

Average discharge.--18 years (1947-65), 0.512 mgd (0.792 cfs).

Extremes.--Maximum discharge during year, 1,120 mgd (1,730 cfs) Feb. 4 (gage height, 8.46 ft from floodmarks), from rating curve extended above 8.4 mgd by test on model of station site; minimum, 0.07 mgd (0.11 cfs) on several days.
1935-65: Maximum discharge, that of Feb. 4, 1965; minimum, 0.03 mgd (0.05 cfs) June 25, 1958, Dec. 5-9, 1962, Feb. 22-24, 26-28, Mar. 14-18, 1963.

Remarks.--Records fair except those for periods of no gage-height record, which are poor. Honolulu Board of Water Supply has diverted ground water from tunnel in drainage area since 1947. Continuous records of rainfall are obtained at station.

Rating table (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used Mar. 10 to May 5, June 11-30)

0	0	0.6	3.20
.1	.17	1.0	7.70
.2	.53	1.5	16.2
.3	.98	2.0	28.2
.4	1.60	3.0	62.8

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.09	0.07	0.09	0.09	0.34	0.20	0.17	0.61	0.4	0.20	5.60	1.04
2	.09	.07	.11	.09	1.92	.20	.17	.65	.4	.20	39.1	.81
3	.09	.07	.09	.09	.55	.20	.17	.65	.4	.23	5.89	.88
4	.09	.07	.09	.09	1.13	.20	.17	16	.4	.20	2.83	.88
5	.09	.09	.09	.09	1.04	.20	.23	3.5	.3	.30	*1.91	.88
6	.09	.14	.09	.45	.45	.20	.17	.8	.3	1.10	.61	.78
7	.09	.11	.09	1.34	.78	.17	.17	.6	.3	.26	.73	.78
8	.11	1.34	.09	.30	.37	.17	.17	2.8	.3	.11	1.40	.78
9	.11	.30	.09	.14	*.23	3.8	.17	.7	.2	.17	.69	.69
10	.11	.17	.09	.14	.20	*2.8	1.18	.4	*.11	.20	.45	*.69
11	.14	.14	.09	.14	.17	1.83	.26	.3	.20	.14	.49	.52
12	.14	.11	.09	.14	.32	.51	.23	.3	.17	.14	.61	.73
13	.14	.11	.07	.11	.76	2.13	.26	.3	.17	*.39	.65	.83
14	.11	.14	.07	.14	3.35	.96	.23	.3	.14	.49	*2.61	.61
15	.11	.14	.07	.17	.34	1.79	.20	.2	.14	.41	2.15	.53
16	.14	.14	.09	.14	.26	1.39	.17	.2	.14	.37	1.22	.49
17	.14	.14	.11	1.85	.23	.53	.17	.3	.17	.37	1.15	.34
18	.14	.14	.11	2.10	.20	.30	.17	.3	.17	.37	1.04	.23
19	.17	.14	.11	1.22	.94	4.71	.17	.3	.17	.41	1.15	.26
20	.14	.14	.11	.37	1.32	.63	.17	.4	.17	.37	1.15	.23
21	.48	.14	.11	.23	.41	.41	.20	.4	.23	*.37	1.15	.26
22	.23	.14	.17	.17	.26	.69	.17	.4	.20	.33	1.10	.37
23	*2.14	.14	.23	.17	.23	*.80	.17	.4	.17	*.51	1.04	.41
24	.61	.14	.44	.14	.30	.30	1.75	.4	.17	.30	1.04	.37
25	6.39	.14	*.26	.14	.23	.26	.45	.4	.17	.26	.69	.30
26	.34	.14	.14	.14	.23	.20	.23	.4	.17	.23	.83	.30
27	.14	.17	.14	.14	.26	.20	.26	.5	.17	.96	.98	.37
28	.11	.14	.11	.17	.34	.17	.37	.5	.17	2.76	.98	.34
29	.09	.11	.11	.36	.23	.17	.45	---------	.17	4.10	.98	.23
30	.09	.09	.11	.34	.20	.17	.53	---------	.23	3.03	.93	.14
31	.07	.09	---------	.30	---------	.17	.57	---------	.20	---------	.93	---------
Total	13.02	5.21	3.66	11.50	17.59	26.46	9.95	33.01	6.80	19.28	82.08	16.07
Mean												
Mgd	0.420	0.168	0.122	0.371	0.586	0.854	0.321	1.18	0.219	0.643	2.65	0.536
Cfs	0.650	0.260	0.189	0.574	0.907	1.32	0.497	1.83	0.339	0.995	4.10	0.829
Ac-ft	40	16	11	35	54	81	31	101	21	59	252	49

Calendar Year 1964: Max 6.39 Min 0.07 Mean mgd 0.384 Mean cfs 0.594 Ac-ft 431
Fiscal Year 1964-65: Max 39.1 Min 0.07 Mean mgd 0.670 Mean cfs 1.04 Ac-ft 750

* Discharge measurement made on this day.
Note.--No gage-height record Dec. 9, 10, Feb. 4 to Mar. 9.

Peak discharge (base, 30 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-25	0730	3.17	70.1	108	1-24	2200	2.92	59.5	92.1
11-14	0230	2.92	59.5	92.1	2-4	0400	8.46	1,120	1,730
12-9	1800	4.06	116	179	5-2	1030	6.07	272	421
12-19	1100	2.18	33.4	51.7	5-4	1930	2.52	33.4	51.7

2836. South Fork Waihee Stream near Heeia

Location.--Lat 21°26'42", long 157°52'10", on left bank 0.6 mile upstream from confluence with North Fork, 3.0 miles southwest of Waiahole School, and 4.0 miles northwest of Heeia.

Drainage area.--0.03 sq mi.

Records available.--September 1962 to June 1965.

Gage.--Water-stage recorder and concrete control. Datum of gage is 615.74 ft above mean sea level (levels by Honolulu Board of Water Supply).

Extremes.--Maximum discharge during year, 180 mgd (279 cfs) May 2 (gage height, 3.96 ft), from rating curve extended above 2.6 mgd by logarithmic plotting; minimum, 1.00 mgd (1.55 cfs) on many days.
1962-65: Maximum discharge, that of May 2, 1965; minimum, 0.92 mgd (1.42 cfs) on many days in 1963.

Remarks.--Records fair except those for periods of no gage-height record and those above 6 mgd, which are poor.

Rating tables (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used Nov. 4-10, May 2-5)

July 1-24		July 25 to June 30			
0.6	0.77	0.6	1.03	1.2	5.80
.7	1.20	.7	1.36	1.5	11.0
.9	2.50	.8	1.83	2.0	25.0
		1.0	3.40		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.00	1.22	1.10	1.13	1.65	1.15	1.33	1.4	1.36	1.36	1.92	1.58
2	1.00	1.22	1.10	1.10	2.43	1.15	1.33	1.4	1.36	1.36	21.2	1.58
3	1.00	1.22	1.10	1.10	1.30	1.15	1.33	1.4	1.36	1.36	2.34	1.54
4	1.00	1.22	1.10	1.10	1.51	1.15	1.33	10	1.36	1.36	2.24	1.54
5	1.00	1.22	1.10	1.10	1.27	1.15	1.5	3.0	1.36	1.42	*1.51	1.54
6	1.00	1.22	1.10	1.23	1.20	1.15	1.4	1.7	1.36	1.93	1.49	1.54
7	1.00	1.22	1.10	1.36	1.3	1.15	1.4	1.6	1.36	1.42	1.49	1.54
8	1.00	1.66	1.10	1.13	1.2	1.15	1.4	2.0	1.36	1.42	1.76	1.54
9	1.00	1.13	1.10	1.13	1.1	1.90	1.4	1.30	1.36	1.49	1.67	1.54
10	1.00	1.13	1.10	1.13	*1.16	1.49	1.6	1.30	1.36	1.45	1.62	1.54
11	1.05	1.10	1.10	1.13	1.15	1.42	1.5	1.30	1.36	1.42	1.62	1.54
12	1.00	1.10	1.10	1.13	1.22	1.30	1.5	1.30	1.36	1.42	1.62	1.54
13	1.00	1.10	1.10	1.13	1.23	1.49	1.5	1.33	1.36	1.45	1.62	1.54
14	1.00	1.10	1.10	1.18	1.81	1.65	1.4	1.33	1.36	1.42	2.06	1.54
15	1.00	1.10	1.10	1.18	1.22	1.62	1.4	1.33	1.36	1.42	1.77	1.54
16	1.00	1.13	1.10	1.18	1.18	1.42	1.4	1.33	1.36	1.42	1.67	*1.54
17	1.00	1.13	1.10	1.55	1.18	1.30	1.4	1.33	1.36	1.42	1.67	1.54
18	1.00	1.10	1.10	1.50	1.18	1.26	1.4	1.33	1.36	1.42	1.62	1.54
19	1.00	1.10	1.10	1.32	1.26	2.63	1.4	1.33	1.36	1.42	1.62	1.54
20	1.00	1.10	1.10	1.22	1.33	1.36	1.4	1.33	1.36	1.42	1.62	1.54
21	1.25	1.10	*1.10	1.22	1.18	1.36	1.4	1.33	1.42	1.42	1.62	1.54
22	1.00	1.10	1.13	1.22	1.15	*1.36	1.4	1.36	1.36	1.42	1.62	1.54
23	1.85	1.10	1.13	1.22	1.15	1.42	1.6	1.36	1.36	1.42	1.62	1.54
24	1.25	1.10	1.15	1.22	1.26	1.33	1.9	1.36	*1.36	1.42	1.62	1.54
25	4.18	1.10	1.13	1.22	1.15	1.43	1.6	1.36	1.36	1.42	1.62	1.54
26	1.26	1.10	1.13	1.22	1.15	1.33	1.4	1.36	1.36	1.42	1.58	1.54
27	*1.24	1.10	1.13	1.22	1.15	1.33	1.4	1.36	1.36	1.49	1.58	1.54
28	1.22	1.10	1.13	1.22	1.18	1.33	1.4	1.36	1.36	1.72	1.58	1.54
29	1.22	1.10	1.13	1.25	1.15	1.33	1.4	---------	1.36	1.77	1.58	1.54
30	1.22	1.10	1.15	1.22	1.15	1.33	1.4	---------	1.36	1.49	1.58	1.54
31	1.22	1.10	---------	1.64	---------	1.33	1.4	---------	1.36	---------	1.58	---------
Total	36.96	35.62	33.31	37.90	38.55	42.92	44.62	49.19	42.22	43.79	71.71	46.28
Mean												
Mgd	1.19	1.15	1.11	1.22	1.28	1.38	1.44	1.76	1.36	1.46	2.31	1.54
Cfs	1.84	1.78	1.72	1.89	1.98	2.14	2.23	2.72	2.10	2.26	3.57	2.38
Ac-ft	113	109	102	116	118	132	137	151	130	134	220	142

Calendar Year 1964: Max 4.18 Min 1.00 Mean mgd 1.22 Mean cfs 1.89 Ac-ft 1,370
Fiscal Year 1964-65: Max 21.2 Min 1.00 Mean mgd 1.43 Mean cfs 2.21 Ac-ft 1,600

* Discharge measurement made on this day.
Note.--No gage-height record Nov. 7-9, Jan. 5 to Feb. 8.

Peak discharge (base, 15 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-25	0630	2.57	52.5	81.2	2-4	0330	3.74	154	238
12- 9	1800	2.09	28.6	44.3	5-2	1400	3.96	180	279
12-19	0800	2.07	27.8	43.0	5-4	1900	2.27	37.5	58.0

2837. North Fork Waihee Stream near Heeia

Location.--Lat 21°26'46", long 157°52'18", on left bank 0.6 mile upstream from confluence with South Fork, 2.8 miles southwest of Waiahole School, and 4.3 miles northwest of Heeia.

Drainage area.--0.03 sq mi.

Records available.--September 1962 to June 1965.

Gage.--Water-stage recorder. Datum of gage is 639.00 ft above mean sea level (levels by Honolulu Board of Water Supply).

Extremes.--Maximum discharge during year, 243 mgd (376 cfs) Feb. 4 (gage height, 3.38 ft), from rating curve extended above 12 mgd by logarithmic plotting; minimum, 1.04 mgd (1.61 cfs) on many days.
1962-65: Maximum discharge, that of Feb. 4, 1965; minimum, 0.86 mgd (1.33 cfs) on many days in 1963.

Remarks.--Records good except those for periods of no gage-height record, which are fair. No diversion above station.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.5	0.99	1.1	6.80
.7	2.18	1.3	11.5
.9	3.98	1.6	23.0

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.08	1.04	1.08	1.13	1.71	1.13	1.34	1.40	1.34	1.40	1.83	1.46
2	1.08	1.04	1.08	1.13	1.80	1.13	1.34	1.40	1.34	1.40	21.0	1.46
3	1.08	1.04	1.08	1.13	1.18	1.13	1.34	a2.0	1.34	1.34	2.27	1.46
4	1.08	1.04	1.08	1.13	a 1.4	1.13	1.34	a20	1.34	1.34	1.93	1.46
5	1.08	1.04	1.08	1.13	a 1.3	1.13	1.46	a 5.0	1.34	1.40	*1.53	1.46
6	1.08	1.04	1.08	1.38	a 1.2	1.13	1.34	a 2.0	1.34	1.91	1.46	1.46
7	1.08	1.04	1.08	1.52	a 1.3	1.13	1.34	a 1.5	1.34	1.40	1.46	1.46
8	1.08	1.62	1.08	1.13	a 1.2	1.13	1.34	a 2.0	1.34	1.34	1.62	1.46
9	1.04	1.08	1.08	1.13	a 1.2	1.96	1.34	a 1.8	1.34	1.46	1.46	1.46
10	1.04	1.08	1.08	1.13	*1.13	1.53	1.64	1.29	1.34	1.40	1.46	1.46
11	1.08	1.08	1.08	1.13	1.13	1.34	1.34	1.29	1.34	1.34	1.46	1.46
12	1.04	1.08	1.08	1.13	1.24	1.24	1.34	1.29	1.34	1.34	1.46	1.46
13	1.04	1.08	1.08	1.13	1.24	1.56	1.34	1.29	1.34	1.40	1.46	1.46
14	1.04	1.08	1.08	1.18	1.82	1.56	1.34	1.29	1.34	1.40	1.82	1.46
15	1.04	1.08	1.08	1.13	1.13	1.68	1.34	1.29	1.34	1.34	1.64	1.46
16	1.04	1.08	1.08	1.13	1.13	1.43	1.34	1.29	1.34	1.34	1.52	*1.46
17	1.04	1.08	1.08	1.44	1.13	1.24	1.34	1.29	1.34	1.34	1.52	1.46
18	1.04	1.08	1.08	1.47	1.13	1.18	1.34	1.29	1.34	1.34	1.52	1.46
19	1.04	1.08	1.08	1.34	1.29	2.41	1.34	1.29	1.34	1.34	1.52	1.46
20	1.04	1.08	a1.1	1.13	1.45	1.40	1.34	1.29	1.34	1.34	1.52	1.46
21	1.26	1.08	*1.13	1.13	1.13	1.34	1.34	1.29	1.40	1.34	1.52	1.46
22	1.08	1.08	1.13	1.13	1.13	*1.34	1.34	1.29	1.34	1.40	1.52	1.46
23	1.78	1.08	1.13	1.13	1.13	1.46	1.48	1.29	1.34	1.40	1.52	1.46
24	1.28	1.08	1.18	1.13	1.30	1.34	2.00	1.29	*1.34	1.34	1.52	1.46
25	3.69	1.08	1.13	1.13	1.13	1.46	1.46	1.34	1.34	1.34	1.52	1.46
26	1.08	1.08	1.13	1.13	1.13	1.34	1.34	1.34	1.34	1.34	1.46	1.46
27	*1.04	1.08	1.13	1.13	1.13	1.34	1.34	1.34	1.34	1.40	1.46	1.46
28	1.04	1.08	1.13	1.13	1.18	1.34	1.34	1.34	1.40	1.64	1.46	1.46
29	1.04	1.08	1.13	1.22	1.13	1.34	1.34	---------	1.40	1.76	1.46	1.46
30	1.04	1.08	1.18	1.13	1.13	1.34	1.40	---------	1.40	1.34	1.46	1.46
31	1.04	1.08	---------	1.75	---------	1.34	1.40	---------	1.40	---------	1.46	---------
Total	36.53	33.74	33.02	37.29	37.63	42.55	43.00	61.81	41.84	42.21	67.82	43.80
Mean												
Mgd	1.18	1.09	1.10	1.20	1.25	1.37	1.39	2.21	1.35	1.41	2.19	1.46
Cfs	1.83	1.69	1.70	1.86	1.93	2.12	2.15	3.42	2.09	2.18	3.39	2.26
Ac-ft	112	104	101	114	115	131	132	190	128	130	208	134

Calendar Year 1964:	Max	3.69	Min	1.04	Mean mgd	1.20	Mean cfs	1.86	Ac-ft	1,350
Fiscal Year 1964-65:	Max	21.0	Min	1.04	Mean mgd	1.43	Mean cfs	2.21	Ac-ft	1,600

* Discharge measurement made on this day.
a No gage-height record.

Peak discharge (base, 20 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-25	0600	2.08	52.4	81.1	2-4	about 0400	3.38	243	376
12- 9	1700	1.68	26.6	41.2					
12-19	0700	1.73	29.2	45.2	5-2	1030	3.26	217	336
1-24	2030	1.99	45.3	70.1	5-4	1900	1.62	23.9	37.0

2838. Waihee Stream at altitude 260 ft, near Heeia

Location.--Lat 21°26'57", long 157°51'55", on right bank 325 ft downstream from confluence of North and South Forks, 2.7 miles southwest of Waiahole School, and 3.7 miles northwest of Heeia.

Drainage area.--0.31 sq mi.

Records available.--May 1961 to June 1965.

Gage.--Water-stage recorder. Datum of gage is 259.28 ft above mean sea level (levels by Honolulu Board of Water Supply).

Extremes.--Maximum discharge during year, 1,100 mgd (1,700 cfs) Feb. 4 (gage height, 6.12 ft), from rating curve extended above 19 mgd; minimum, 1.87 mgd (2.89 cfs) July 5, 10.

1961-65: Maximum discharge, that of Feb. 4, 1965; minimum, 1.56 mgd (2.41 cfs) Oct. 10, 1962.

Revisions.--The maximum discharge for the fiscal year 1963 has been revised to 333 mgd (515 cfs) Apr. 15, 1963 (gage height, 4.91 ft), superseding figure published in Surface Water Records of Hawaii and other Pacific Areas (1963).

Remarks.--Records good July 1 to May 1 and fair May 2 to June 30 except those above 40 mgd, which are poor. Honolulu Board of Water Supply tunnel draft affects flow at station.

Revisions.--Revised figures of discharge for some peak discharges in the fiscal year 1963, superseding those published in Surface Water Records of Hawaii and other Pacific Areas (1963), are given herewith: Apr. 15 (1100) 333 mgd (515 cfs), 4.91 ft; May 14 (1430) 260 mgd (402 cfs), 4.60 ft.

Rating table (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used Feb. 4 to June 30)

0.4	1.45
.7	3.50
1.1	7.20
1.5	16.0
2.0	33.5
3.0	90.0

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.93	2.14	2.28	2.35	5.45	2.56	2.70	2.56	3.05	3.26	4.55	3.12
2	1.93	2.07	2.28	2.35	7.28	2.56	2.70	2.49	3.12	3.26	74.3	3.12
3	1.93	1.93	2.21	2.35	3.42	2.56	2.70	2.88	3.12	3.22	5.84	3.12
4	1.93	1.93	2.21	2.28	4.01	2.56	2.70	34.0	3.12	3.12	5.17	3.12
5	1.93	*1.93	2.21	2.35	3.56	2.56	3.23	6.75	3.09	3.26	3.74	3.12
6	1.93	2.07	2.14	2.98	3.05	2.56	2.77	3.74	3.05	5.96	3.34	3.12
7	1.93	*1.93	2.14	5.00	3.20	2.56	2.77	3.50	3.05	3.05	3.26	3.12
8	1.93	5.14	2.14	2.70	2.98	2.56	2.77	5.39	3.05	2.77	3.58	3.12
9	1.93	2.77	2.21	2.49	2.84	7.62	2.77	*3.71	3.05	2.91	3.26	3.12
10	1.93	2.56	2.14	2.49	*2.77	5.25	4.42	2.91	3.12	2.84	3.12	3.12
11	2.14	2.42	2.14	2.42	2.77	4.32	2.91	2.84	3.26	2.70	3.12	3.12
12	2.07	2.35	2.14	2.42	3.05	3.10	2.84	2.77	3.19	2.63	3.19	3.12
13	2.00	2.35	2.14	2.35	3.09	4.84	3.05	2.84	3.19	2.91	3.26	3.12
14	2.00	2.35	2.14	2.42	8.35	4.88	2.91	2.84	3.19	2.77	4.14	3.12
15	2.07	2.35	2.21	2.56	2.91	6.00	2.91	2.91	3.19	2.70	3.82	3.12
16	2.21	2.42	2.28	2.49	2.70	4.50	2.84	2.91	3.19	2.70	3.42	*3.12
17	2.14	2.35	2.28	4.13	2.70	3.05	2.84	2.98	3.19	2.70	3.34	3.12
18	2.07	2.35	2.28	4.79	2.70	2.63	2.84	2.98	3.26	2.70	3.26	3.19
19	2.14	2.35	2.28	3.58	3.12	9.73	2.84	2.98	3.26	*2.70	3.26	3.19
20	2.07	2.28	2.35	2.63	4.68	2.91	2.84	2.98	3.26	2.77	3.26	3.19
21	*2.82	*2.28	*2.28	2.49	2.84	2.56	2.91	2.98	3.34	2.77	3.19	3.26
22	2.21	2.28	2.35	2.35	2.70	*2.72	2.84	2.98	3.26	2.84	3.19	3.26
23	6.29	2.28	2.35	2.35	2.77	3.22	3.21	3.05	3.26	2.84	3.19	3.26
24	3.44	2.28	2.63	2.28	3.34	2.77	6.52	3.05	3.26	2.77	3.12	3.26
25	16.5	2.28	*2.35	2.28	2.77	3.26	3.42	3.05	3.26	2.77	3.12	3.19
26	2.77	2.28	2.35	2.28	2.84	2.77	2.91	3.05	3.26	2.70	3.12	3.19
27	*2.35	2.28	2.28	2.28	2.84	2.77	2.84	3.12	3.26	2.98	3.12	3.19
28	2.28	2.28	2.28	2.28	2.98	2.70	2.77	3.12	3.26	4.08	3.05	3.19
29	2.21	2.28	2.35	2.61	2.70	2.70	2.70	---------	3.26	4.81	3.05	3.19
30	2.21	2.28	2.49	2.63	2.63	2.77	2.63	---------	3.42	2.84	3.12	3.12
31	2.07	2.28	---------	5.58	---------	2.70	2.63	---------	3.26	---------	3.12	---------
Total	85.36	73.12	67.91	86.54	103.04	110.25	93.73	121.36	99.10	92.33	178.62	94.72
Mean												
Mgd	2.75	2.36	2.26	2.79	3.43	3.56	3.02	4.33	3.20	3.08	5.76	3.16
Cfs	4.25	3.65	3.50	4.32	5.31	5.51	4.67	6.76	4.95	4.77	8.91	4.89
Ac-ft	262	224	208	266	316	338	288	372	304	283	548	291

Calendar Year 1964: Max 16.5 Min 1.93 Mean mgd 2.94 Mean cfs 4.55 Ac-ft 3,300
Fiscal Year 1964-65: Max 74.3 Min 1.93 Mean mgd 3.30 Mean cfs 5.11 Ac-ft 3,740

* Discharge measurement made on this day.

Peak discharge (base, 55 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-25	0630	3.48	124	192	1-24	2000	3.58	131	203
12- 9	1800	3.38	117	181	2- 4	0330	6.12	1,100	1,700
12-19	0730	2.84	80.4	124	5- 2	1000	5.68	680	1,050

2840. Waihee Stream near Heeia

Location.--Lat 21°27'00", long 157°51'40", on left bank 70 ft upstream from intake of Kihe ditch, 120 ft downstream from forest-reserve boundary, 3.5 miles northwest of Heeia, and 4.4 miles northwest of Kaneohe.

Drainage area.--0.93 sq mi.

Records available.--December 1935 to June 1965. See also Note below.

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 193.44 ft above mean sea level (levels by Honolulu Board of Water Supply).

Average discharge.--29 years (1936-65), 6.14 mgd (9.50 cfs).

Extremes.--Maximum discharge during year, 3,300 mgd (5,110 cfs) Feb. 4 (gage height, 8.72 ft, from floodmarks), from rating curve extended above 33 mgd on basis of slope-area measurements at gage heights 6.06 and 8.72 ft; minimum, 2.96 mgd (4.58 cfs) on several days.
1935-65: Maximum discharge, that of Feb. 4, 1965; minimum, 2.17 mgd (3.36 cfs) Oct. 15, 16, 1962.
Revisions.--The maximum discharge for the fiscal year 1962 has been revised to about 400 mgd (about 620 cfs) Mar. 12, 1962 (gage height, unknown), superseding figure published in Surface Water Records of Hawaii and other Pacific Areas (1962).

Remarks.--Records good except those for period of no gage-height record, which are fair. Honolulu Board of Water Supply diverts ground water from tunnel in drainage area.

Note.--Published records for peaks in the fiscal years 1940-43, 1947-50, 1953, 1955, 1958 and 1959 have been found to be in error; revised records are on file in the district office and will be published in the next water-supply paper.

Rating tables (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used May 7 to June 22)

July 1 to May 1				May 2 to June 30			
0.5	2.10	2.0	33.0	0.6	4.12	3.0	77.0
.7	4.20	3.0	77.0	1.0	10.4	4.0	135
1.0	8.40	4.0	135	1.5	21.5	4.5	175
1.5	18.5			2.0	35.8	4.8	255
				2.5	53.0		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.28	3.86	3.16	3.28	7.10	4.20	4.80	4.32	4.44	5.16	10.0	5.45
2	3.28	3.62	3.28	3.16	11.7	4.20	4.80	4.20	4.56	5.04	*a250	5.45
3	3.28	3.62	3.16	3.05	5.54	4.32	4.80	4.56	4.56	4.92	a18	5.32
4	3.28	3.51	3.16	3.05	5.86	4.20	4.80	*101	4.56	4.80	a12	5.32
5	3.16	3.62	3.16	3.40	5.40	4.08	5.28	17.2	4.56	4.92	a 8.6	5.32
6	3.16	3.74	3.05	4.05	4.68	4.08	4.80	8.08	4.56	9.19	a 7.8	5.18
7	3.16	3.62	3.05	5.97	4.80	4.08	4.80	6.66	4.44	5.68	6.95	5.18
8	3.16	6.76	2.96	3.86	4.56	4.08	4.68	9.97	4.44	5.16	8.46	5.18
9	3.16	4.08	3.05	3.62	4.32	18.7	4.68	8.00	4.44	5.28	7.28	5.18
10	3.05	3.86	3.05	3.51	*4.20	*10.9	7.29	5.54	4.56	5.16	6.35	5.18
11	3.40	3.74	2.96	3.51	4.08	8.08	5.16	4.92	4.80	4.92	6.05	5.18
12	3.28	3.62	3.05	3.40	4.44	5.58	5.16	4.80	4.68	4.80	6.20	5.18
13	3.16	3.62	2.96	3.28	4.47	8.02	5.16	4.68	4.68	5.28	5.90	5.18
14	3.16	3.62	3.05	3.40	28.4	7.33	5.04	4.44	4.68	5.04	8.60	5.18
15	3.16	3.51	3.16	3.40	5.16	*9.97	5.04	4.32	4.56	4.92	8.44	5.18
16	3.28	3.51	3.28	3.40	4.56	7.45	4.92	*4.32	4.56	4.80	7.12	5.18
17	3.16	3.40	3.40	5.60	4.44	5.96	4.92	4.32	4.68	4.80	6.35	5.18
18	3.16	*3.40	3.28	6.85	4.44	5.16	4.80	4.44	4.80	4.80	6.05	5.18
19	3.16	*3.28	3.28	5.68	4.68	21.8	4.80	4.44	4.80	*4.68	6.05	5.05
20	3.05	3.28	3.28	4.32	7.10	6.66	4.80	4.56	4.80	4.68	5.90	5.18
21	3.95	3.28	3.28	4.08	5.16	5.82	5.04	4.56	5.04	4.68	5.75	5.18
22	3.51	3.16	*3.28	3.86	4.56	5.82	4.80	4.68	4.92	4.80	5.60	*5.18
23	7.79	3.16	3.28	3.74	4.56	6.24	5.23	4.68	4.92	4.80	5.60	5.18
24	5.16	3.16	3.62	3.62	5.28	5.28	9.49	4.68	4.92	4.80	5.45	5.18
25	19.0	3.05	3.40	3.62	4.56	5.82	5.40	4.68	4.92	4.68	5.45	5.18
26	5.68	3.05	3.28	3.62	4.56	5.16	4.68	4.68	4.92	4.68	*5.32	5.18
27	*4.35	3.21	3.16	3.62	4.56	5.16	4.56	4.80	4.92	5.40	5.32	5.05
28	4.08	3.28	3.16	3.62	4.68	5.04	4.44	4.66	4.92	7.14	5.32	5.05
29	3.97	3.28	3.16	3.86	4.44	4.92	4.44	---------	4.92	10.9	5.32	5.05
30	3.86	3.28	3.28	3.82	4.20	4.92	4.44	---------	5.28	6.80	5.32	5.05
31	3.74	3.16	---------	6.47	---------	4.80	4.44	---------	5.16	---------	5.32	---------
Total	129.03	110.34	95.68	123.72	176.49	207.83	157.49	252.19	147.00	162.71	461.87	155.71
Mean												
Mgd	4.16	3.56	3.19	3.99	5.88	6.70	5.08	9.01	4.74	5.42	14.9	5.19
Cfs	6.44	5.51	4.94	6.17	9.10	10.4	7.86	13.9	7.33	8.39	23.1	8.03
Ac-ft	396	339	294	380	542	638	483	774	451	499	1420	478

Calendar Year 1964: Max 28.4 Min 2.96 Mean mgd 4.74 Mean cfs 7.33 Ac-ft 5330
Fiscal Year 1964-65: Max 250 Min 2.96 Mean mgd 5.97 Mean cfs 9.24 Ac-ft 6690

Peak discharge (base, 90 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
12- 9	1830	5.04	360	557	2-4	0400	8.72	3,300	5,110
12-19	1100	4.42	168	260	5-2	1430	6.31	3,000	4,640

* Discharge measurement made on this day.
a No gage-height record.

2850. Waiahole tunnel at Waianu, near Waiahole

Location.--Lat 21°29'05", long 157°53'15", on left bank in Waiahole tunnel at Waianu Stream intake and 2.1 miles west of Waiahole School.

Records available.--December 1950 to June 1965.

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 785.5 ft above mean sea level (levels by Waiahole Water Co.).

Average discharge.--14 years (1951-65), 24.9 mgd (38.5 cfs).

Extremes.--1950-65: Maximum daily discharge, 74.0 mgd (114 cfs) July 28, 1954; minimum daily, 16.0 mgd (24.8 cfs) Jan. 24-29, 1952.

Remarks.--Records excellent except those above 60 mgd, which are good. Tunnel diverts from headwaters of nearly all streams from Waiahole Valley to Kahana Valley for irrigation in central Oahu. Occasional releases at various intakes above station.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	*26.2	26.9	25.8	27.1	47.4	29.1	30.9	30.4	31.2	*30.0	39.8	34.0
2	26.2	26.7	25.8	25.3	57.8	31.2	30.9	30.4	32.8	30.0	69.5	31.9
3	26.2	26.7	25.8	26.2	34.7	28.8	31.9	37.1	33.1	30.7	50.0	31.6
4	26.0	26.7	26.0	25.1	37.3	28.5	30.9	56.6	31.4	30.0	45.6	31.6
5	26.0	27.4	27.2	29.4	39.5	28.5	30.9	42.6	31.2	37.9	36.3	31.6
6	26.2	26.9	25.8	47.1	31.4	28.5	30.9	35.6	31.2	47.6	34.3	31.4
7	26.0	26.7	25.6	40.2	38.3	28.3	30.9	33.1	30.9	33.3	34.6	31.4
8	26.0	41.5	25.3	27.6	30.7	28.5	30.9	36.7	31.2	30.7	36.4	31.4
9	27.8	27.8	26.7	26.7	35.4	37.1	30.7	34.0	30.9	34.0	33.1	31.2
10	26.2	26.9	25.3	26.0	30.0	46.0	37.9	32.8	34.1	33.1	32.1	31.2
11	31.2	26.5	25.1	26.5	28.8	36.8	31.2	32.4	32.8	30.7	32.1	31.2
12	27.8	26.9	25.1	25.6	32.3	36.2	30.9	32.1	31.4	30.2	32.6	30.9
13	26.5	26.5	25.1	25.6	29.5	40.3	35.5	31.9	30.9	30.7	32.1	30.9
14	26.2	27.4	25.1	27.8	43.1	31.9	31.2	31.9	30.7	30.2	42.1	30.9
15	26.5	26.7	27.5	27.2	29.5	50.1	30.9	31.6	30.7	30.2	46.2	30.9
16	27.2	30.5	32.9	27.2	29.0	38.1	30.7	31.6	30.7	30.0	38.6	30.9
17	26.5	28.5	26.5	37.2	28.8	31.9	30.7	31.6	30.4	29.7	35.6	30.7
18	26.2	26.7	25.6	36.2	29.2	29.7	30.7	31.6	30.4	29.7	33.1	30.7
19	29.4	26.5	25.3	42.9	44.1	39.1	30.7	31.6	30.4	30.4	32.1	31.2
20	26.5	26.2	26.9	30.8	39.6	31.9	30.7	31.4	30.2	31.6	32.1	30.7
21	36.4	26.2	26.9	38.6	30.0	34.9	30.7	31.4	30.2	30.0	33.1	30.7
22	28.3	26.0	26.9	28.1	29.2	35.3	30.4	31.4	30.2	30.0	32.1	32.6
23	54.4	26.0	26.2	27.4	29.2	46.5	34.5	31.2	31.9	30.7	31.6	30.7
24	40.2	26.0	32.0	26.9	28.8	32.4	44.9	31.2	30.7	30.4	31.6	30.4
25	41.7	26.0	26.7	26.5	28.8	33.4	34.5	31.2	30.2	29.7	31.4	30.4
26	28.1	26.0	25.6	26.5	34.7	31.6	31.4	31.2	30.0	29.7	32.1	30.2
27	27.8	29.1	25.3	26.5	30.0	30.9	30.9	31.2	30.0	31.6	32.1	30.4
28	27.6	27.2	25.1	26.5	28.5	31.2	30.7	31.2	29.7	42.5	31.6	30.2
29	27.6	26.0	25.1	33.5	28.3	31.4	30.9	---------	29.7	45.2	32.6	30.0
30	27.4	25.8	25.8	26.9	28.3	31.6	30.4	---------	34.0	36.3	33.6	29.7
31	27.2	25.8	---------	44.3	---------	30.9	30.4	---------	30.7	---------	31.9	---------
Total	903.5	846.7	790.0	939.4	1012.2	1050.6	989.7	937.0	963.9	976.8	1122.0	931.6
Mean												
Mgd	29.1	27.3	26.3	30.3	33.7	33.9	31.9	33.5	31.1	32.6	36.2	31.1
Cfs	45.0	42.2	40.7	46.9	52.1	52.5	49.4	51.8	48.1	50.4	56.0	48.1
Ac-ft	2770	2600	2420	2880	3110	3220	3040	2880	2960	3000	3440	2860

Calendar Year 1964:	Max	69.9	Min	23.5	Mean mgd	29.1	Mean cfs	45.0	Ac-ft	32700		
Fiscal Year 1964-65:	Max	69.5	Min	25.1	Mean mgd	31.4	Mean cfs	48.6	Ac-ft	35180		

* Discharge measurement made on this day.

2860. Waiahole tunnel wasteway at intake 31, near Waiahole

Location.--Lat 21°28'30", long 157°53'15", on left bank 150 ft downstream from wasteway gates at Waiahole tunnel intake No. 31 and 2.2 miles west of Waiahole School.

Records available.--January 1951 to June 1965.

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 742.7 ft above mean sea level (levels by Waiahole Water Co.).

Average discharge.--14 years, 0.850 mgd (1.32 cfs).

Extremes.--1951-65: Maximum daily discharge, 62.1 mgd (96.1 cfs) Dec. 1, 1957; no flow most of the time.

Remarks.--Records good. Station measures releases from Waiahole tunnel to Waiahole Stream.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	(*)		(*)	(*)		(*)	0	*0	(*)	*0	0	(*)
2					(*)		0	0		0	4.88	
3		(*)					0	0		0	7.72	
4							*0	5.93		0	9.09	
5							0	0		0	2.91	
6							0	0		.35	.47	
7							0	0		0	0	
8							0	6.84		0	0	
9							0	0		0	0	
10						(*)	0	0		0	0	
11							0	0		0	0	
12							0	0		0	0	
13							0	0		0	0	
14							*23.4	0		0	.22	
15							26.8	0		0	4.02	
16							22.1	0		0	4.84	
17							22.1	0		0	.97	
18							22.1	0		0	.10	
19							22.1	0		0	.05	
20							22.1	0		0	0	
21							6.38	0		0	0	
22							0	0		0	0	
23							0	0		0	0	
24							0	0		0	0	
25							0	0		0	0	
26							0	0		0	0	
27							0	0		0	0	
28							0	0		0	0	
29							0	---------		0	0	
30							0	---------		0	0	
31			----------		----------		0	---------		----------	0	----------
Total	0	0	0	0	0	0	167.08	12.77	0	0.35	35.27	0
Mean												
Mgd	0	0	0	0	0	0	5.39	0.456	0	0.012	1.14	0
Cfs	0	0	0	0	0	0	8.34	0.706	0	0.019	1.76	0
Ac-ft	0	0	0	0	0	0	513	39	0	1.1	108	0

Calendar Year 1964:	Max	23.6	Min	0	Mean mgd	1.15	Mean cfs	1.78	Ac-ft	1,290
Fiscal Year 1964-65:	Max	26.8	Min	0	Mean mgd	0.590	Mean cfs	0.913	Ac-ft	661

* Discharge measurement or observation of no flow made on this day.

2870. Waiahole tunnel at north portal, near Waiahole

Location.--Lat 21°28'15", long 157°53'30", on right bank in Waiahole tunnel directly below crest of Koolau Range and 2.6 miles southwest of Waiahole School.

Records available.--January 1951 to June 1965.

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 752.5 ft above mean sea level (levels by Waiahole Water Co.).

Average discharge.--14 years, 26.8 mgd (41.5 cfs).

Extremes.--1951-65: Maximum daily discharge, 81.0 mgd (125 cfs) July 28, 1954; minimum daily, 1.48 mgd (2.29 cfs) Dec. 9, 1956.

Remarks.--Records excellent. Tunnel diverts from headwaters of nearly all streams from Kahana Valley to Waiahole Valley for irrigation in central Oahu. Occasional releases at numerous intakes above station.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	*29.2	30.4	29.2	*30.1	53.0	30.9	32.9	32.9	35.5	*34.2	43.4	38.4
2	29.2	29.9	28.7	28.5	62.2	32.9	32.9	32.4	36.8	34.2	75.6	36.5
3	29.2	29.7	28.7	28.7	37.6	30.2	33.9	39.6	37.6	34.7	46.8	36.3
4	29.2	29.7	28.7	28.2	40.8	29.9	32.9	50.9	35.8	34.2	38.9	36.0
5	29.2	30.4	29.9	32.1	43.3	29.9	33.4	45.9	35.5	41.7	36.0	36.0
6	29.4	30.2	29.2	50.2	35.0	29.7	32.9	38.1	35.2	52.0	36.3	36.0
7	29.2	29.9	28.7	45.2	41.5	29.9	32.9	35.8	35.2	35.8	36.8	35.8
8	29.4	47.4	28.5	31.1	34.5	30.4	32.9	31.8	35.5	34.2	38.8	35.5
9	30.9	31.9	29.7	29.7	38.7	41.8	32.9	36.8	35.2	38.1	35.8	35.5
10	29.2	30.9	28.5	29.2	33.2	51.6	41.5	35.2	38.5	37.3	35.0	35.2
11	34.8	30.4	28.2	29.7	31.9	40.2	33.2	36.0	38.1	35.0	35.0	35.2
12	31.1	30.9	28.2	29.0	34.5	37.8	33.2	36.3	36.0	34.5	35.2	35.2
13	29.4	30.4	28.2	28.7	34.3	43.8	38.2	36.3	35.5	34.7	35.0	34.7
14	29.2	31.4	28.2	31.1	46.5	36.5	11.8	36.3	35.2	34.5	46.3	34.5
15	29.4	30.6	30.2	30.6	30.9	54.3	7.25	36.3	35.2	33.7	44.5	34.7
16	30.4	34.7	35.8	30.2	31.6	41.9	11.9	36.3	34.5	32.1	36.5	35.0
17	29.4	32.6	29.9	40.9	31.9	34.2	11.7	36.3	35.0	31.9	37.3	34.7
18	29.2	30.6	28.5	40.1	32.6	32.1	11.7	36.3	35.0	31.9	35.8	34.7
19	32.8	30.4	28.2	46.3	48.0	43.1	11.7	36.3	35.0	33.7	35.2	35.2
20	29.4	30.2	29.9	33.9	45.1	35.0	11.6	36.3	35.0	35.8	35.2	34.5
21	40.7	30.2	29.9	42.3	33.4	36.5	26.6	36.3	35.2	33.7	36.3	34.2
22	31.6	29.9	30.4	31.1	32.1	37.8	32.4	36.3	35.0	33.7	35.0	36.3
23	60.4	29.9	29.4	30.4	31.4	48.6	36.7	36.3	36.3	35.0	34.7	34.2
24	45.0	29.9	35.5	30.2	30.4	34.5	47.8	36.3	35.5	34.7	34.5	34.2
25	47.0	29.9	29.7	29.7	29.9	35.5	36.6	36.3	34.7	33.7	34.5	34.2
26	31.6	29.9	28.7	29.4	37.7	33.4	33.4	36.0	34.7	33.7	36.0	34.2
27	30.9	32.8	28.5	29.4	32.1	33.2	33.4	36.0	34.5	36.0	36.8	34.2
28	30.6	30.9	28.2	29.7	30.4	33.2	33.2	35.8	34.5	47.7	36.5	33.9
29	30.6	29.9	28.2	36.7	29.9	33.2	33.2	---------	33.7	50.1	37.3	33.7
30	30.6	29.7	28.2	30.2	29.9	33.4	32.9	---------	38.3	38.9	38.6	33.7
31	30.4	29.7	---------	50.8	---------	32.9	32.9	---------	35.2	---------	36.5	---------
Total	1008.6	965.3	881.8	1043.4	1104.3	1128.3	900.45	1031.4	1102.9	1091.4	1196.1	1052.4
Mean												
Mgd	32.5	31.1	29.4	33.7	36.8	36.4	29.0	36.8	35.6	36.4	38.6	35.1
Cfs	50.3	48.1	45.5	52.1	56.9	56.3	44.9	56.9	55.1	56.3	59.7	54.3
Ac-ft	3,100	2,960	2,710	3,200	3,390	3,460	2,760	3,170	3,380	3,350	3,670	3,230

Calendar Year 1964:	Max	74.0	Min	1.78	Mean mgd	30.6	Mean cfs	47.3	Ac-ft	34,370
Fiscal Year 1964-65:	Max	75.6	Min	7.25	Mean mgd	34.3	Mean cfs	53.1	Ac-ft	38,380

* Discharge measurement made on this day.

2872. Waiahole tunnel at adit 8, near Waipahu

Location.--Lat 21°27'00", long 157°57'30", on left bank at adit 8, 2,700 ft downstream from Ewa Forest Reserve, and 5.2 miles northeast of Waipahu Post Office.

Records available.--August 1956 to June 1965.

Gage.--Water-stage recorder and concrete control. Datum of gage is 709.0 ft above mean sea level (levels by Waiahole Water Co.).

Average discharge.--8 years (1957-65), 32.2 mgd (49.8 cfs).

Extremes.--1956-65: Maximum daily discharge, 97.4 mgd (151 cfs) Oct. 23, 1958; minimum daily, 6.0 mgd (9.3 cfs) Dec. 9, 1956.

Remarks.--Records good. Records represent entire flow of Waiahole water-development tunnel; water is used for irrigation of sugarcane in vicinity of Waipahu.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	*33.0	35.2	*33.6	34.8	53.2	34.9	38.2	*38.5	*40.9	*39.5	45.5	*42.8
2	33.0	35.2	33.6	33.0	*66.1	37.2	37.8	38.2	41.6	39.2	85.0	40.9
3	33.0	*34.9	33.6	33.6	42.3	34.9	38.8	43.0	43.7	39.8	52.0	40.2
4	33.0	34.6	33.6	32.7	44.0	34.9	*38.5	58.2	41.2	39.5	*44.0	40.2
5	33.0	35.2	34.3	35.6	46.7	34.6	38.5	52.0	41.2	45.4	41.6	40.2
6	33.3	34.9	33.6	50.8	39.8	34.6	38.2	45.1	41.6	56.8	41.6	40.2
7	33.0	34.6	33.3	51.1	45.1	34.6	38.2	42.3	41.2	42.3	42.3	40.2
8	33.3	50.5	33.3	35.9	38.8	34.9	38.2	36.3	41.2	40.6	43.7	39.8
9	35.2	36.5	34.3	34.6	41.9	44.8	37.8	44.8	41.2	43.0	41.2	39.8
10	33.6	35.2	33.3	34.0	38.2	55.4	46.0	41.6	44.0	43.4	40.2	39.8
11	37.5	34.6	33.0	34.0	36.2	45.8	38.8	42.0	44.0	40.2	40.2	39.8
12	36.2	34.9	33.0	33.3	38.8	41.6	38.5	42.6	42.3	39.8	40.6	39.8
13	34.0	34.6	33.0	33.0	36.2	48.2	42.6	42.3	41.6	40.2	40.6	39.5
14	33.6	35.2	33.0	34.3	52.6	40.6	21.3	42.3	41.2	39.8	49.2	38.8
15	34.0	34.9	33.6	35.2	35.9	58.3	14.1	42.3	40.9	38.8	50.1	38.8
16	34.9	37.8	40.2	34.0	35.9	45.8	18.8	42.3	40.6	37.5	41.2	39.2
17	34.3	36.9	35.2	44.1	35.9	39.8	18.5	42.3	40.9	37.2	42.3	39.2
18	34.0	34.9	33.6	42.7	36.2	37.2	18.2	42.3	40.6	36.9	40.6	39.2
19	36.9	34.6	33.3	49.7	49.9	46.5	18.2	42.0	40.6	38.2	39.8	39.5
20	34.3	34.6	34.6	38.2	49.2	39.5	18.2	42.0	40.6	40.6	39.5	39.2
21	43.7	34.3	34.3	46.2	37.2	41.2	30.4	41.6	40.9	38.5	40.2	39.2
22	36.5	34.0	34.9	35.9	36.2	41.2	37.2	41.6	40.2	38.5	39.2	40.9
23	62.5	34.0	34.3	34.9	35.9	52.2	39.0	41.6	41.6	39.2	38.8	39.5
24	49.6	34.0	39.5	34.3	35.2	39.5	51.6	41.6	41.6	39.2	38.8	39.2
25	52.1	34.0	34.9	34.0	34.9	39.8	43.6	41.6	40.2	38.2	38.5	39.2
26	37.2	33.6	33.6	33.6	40.4	38.2	38.8	41.2	39.8	37.8	40.2	39.2
27	36.2	35.7	33.3	33.6	37.5	37.8	38.5	40.9	39.8	39.8	40.9	39.2
28	36.2	35.2	33.0	33.6	35.2	37.8	38.5	40.9	39.8	50.4	40.6	39.2
29	35.9	34.0	33.0	40.2	34.6	38.2	38.8	---------	39.2	53.8	41.6	39.2
30	36.2	33.6	33.0	34.6	34.6	38.5	38.5	---------	42.3	43.4	42.3	39.2
31	35.6	33.6	---------	51.7	---------	38.2	38.5	---------	41.2	---------	40.6	---------
Total	1144.8	1095.8	1022.8	1167.2	1224.6	1266.7	1070.8	1193.4	1277.7	1237.5	1342.9	1191.1
Mean												
Mgd	36.9	35.3	34.1	37.7	40.8	40.9	34.5	42.6	41.2	41.2	43.3	39.7
Cfs	57.1	54.6	52.8	58.3	63.1	63.3	53.4	65.9	63.7	63.7	67.0	61.4
Ac-ft	3,510	3,360	3,140	3,580	3,760	3,890	3,290	3,660	3,920	3,800	4,120	3,660

Calendar Year 1964:	Max	74.1	Min	7.42	Mean mgd	34.6	Mean cfs	53.5	Ac-ft	38,810
Fiscal Year 1964-65:	Max	85.0	Min	14.1	Mean mgd	39.0	Mean cfs	60.3	Ac-ft	43,690

* Discharge measurement made on this day.

2910. Waiahole Stream at altitude 250 ft, near Waiahole

Location.--Lat 21°28'35", long 157°52'30", on left bank 1.5 miles southwest of Waiahole School and 2.7 miles northwest of Kahaluu.

Drainage area.--0.99 sq mi.

Records available.--July 1955 to June 1965.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 250 ft (from topographic map).

Average discharge.--10 years, 4.85 mgd (7.50 cfs).

Extremes.--Maximum discharge during year, 1,440 mgd (2,230 cfs) May 2 (gage height, 4.80 ft, from floodmarks), from rating curve extended above 72 mgd as explained below; minimum, 2.10 mgd (3.25 cfs) Sept. 7-11.

1955-65: Maximum discharge, 1,440 mgd (2,230 cfs) Apr. 15, 1963, May 2, 1965 (gage height, 4.80 ft), from rating curve extended above 72 mgd on basis of field estimate at gage height 4.23 ft and slope-area measurement of peak flow; minimum, 1.48 mgd (2.29 cfs) Oct. 7-13, 1962.

Remarks.--Records good except those for period of no gage-height record, which are fair. During the fiscal year, an average of 1.20 million gallons a day was diverted above station by pumping into Waiahole tunnel for irrigation in central Oahu. Continuous records of rainfall are obtained at station.

Rating table (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used Feb. 4-11)

0.5	1.72	1.6	33.5
.7	4.00	2.0	61.0
.9	7.50	2.5	114
1.2	15.5	3.0	195

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.51	2.51	2.20	2.30	9.42	4.80	5.28	4.80	2.97	2.40	8.12	4.96
2	2.51	2.40	2.20	2.30	10.4	4.80	5.12	4.80	2.97	2.30	a120	4.80
3	2.51	2.40	2.20	2.20	4.00	4.80	5.12	6.08	2.97	2.51	a34	4.48
4	2.40	2.40	2.20	2.20	3.48	4.64	5.12	100	2.85	2.40	a24	4.48
5	2.51	2.62	2.20	2.30	3.61	4.48	5.44	22.3	2.85	2.40	13.7	4.32
6	2.51	2.62	2.20	3.01	3.35	4.48	5.28	7.50	2.85	9.67	9.18	4.32
7	2.40	2.51	2.10	5.28	4.25	4.48	5.12	5.98	2.73	5.98	7.74	4.32
8	2.40	5.87	2.10	3.09	3.87	4.16	5.12	15.2	2.73	3.74	11.2	4.32
9	2.62	3.35	2.10	2.62	*3.48	6.69	5.12	6.17	2.73	3.22	8.70	4.16
10	2.40	2.73	2.10	2.51	3.09	19.9	7.69	5.28	3.09	3.09	7.50	4.16
11	2.73	2.51	2.20	2.51	2.85	10.2	5.44	*4.32	3.48	2.97	6.93	4.16
12	2.73	2.51	2.20	2.40	3.48	6.17	5.12	3.74	3.09	2.85	7.12	4.16
13	2.40	2.51	2.20	2.40	3.35	10.9	5.60	3.74	2.73	3.09	7.12	4.32
14	2.40	2.62	2.20	2.51	9.11	10.4	22.0	3.61	2.62	2.97	12.4	4.96
15	2.40	2.51	2.20	2.62	5.12	11.9	28.5	3.48	2.51	3.48	14.3	4.64
16	2.51	2.73	2.73	2.51	3.87	9.40	25.0	3.35	3.09	4.48	12.6	4.00
17	2.40	2.62	2.20	3.77	3.35	7.08	25.0	3.35	2.51	4.48	9.53	3.87
18	2.30	2.51	2.20	4.63	3.48	*5.60	25.0	3.22	2.51	4.48	7.31	3.87
19	2.73	2.51	2.20	4.48	4.00	23.2	24.5	3.22	2.51	3.48	7.12	3.87
20	2.40	2.30	2.20	3.61	6.65	8.54	24.5	3.09	2.51	2.97	6.93	3.74
21	2.73	2.30	2.20	3.09	4.00	6.36	11.0	3.09	2.73	*2.80	7.12	*3.74
22	2.51	2.20	2.30	2.97	3.61	6.74	4.80	3.09	2.51	3.22	6.74	3.87
23	9.26	2.20	2.20	2.85	4.16	7.97	4.96	3.09	2.40	3.74	6.74	3.74
24	5.60	2.20	2.51	2.85	4.80	6.36	11.6	3.09	2.40	3.87	6.55	3.74
25	19.9	2.30	2.30	2.73	4.80	6.36	6.36	3.09	2.40	3.22	6.55	3.74
26	4.16	2.20	2.20	2.73	7.35	5.60	5.12	2.97	2.30	2.97	5.28	3.74
27	3.09	2.20	2.20	2.73	6.17	5.60	5.12	2.97	2.30	4.00	4.80	3.61
28	2.85	2.30	*2.20	2.73	5.28	5.44	4.96	2.97	2.30	7.06	4.80	3.61
29	2.73	2.20	2.20	3.00	4.80	5.28	4.96	---------	2.85	9.19	4.64	3.61
30	*2.68	2.20	2.40	2.97	4.80	5.28	4.80	---------	3.09	5.60	4.80	3.61
31	2.62	2.20	---------	8.33	---------	5.28	4.80	---------	2.51	---------	4.64	---------
Total	107.90	79.24	66.84	96.23	143.98	232.89	313.55	237.59	84.09	118.63	398.16	122.92
Mean												
Mgd	3.48	2.56	2.23	3.10	4.80	7.51	10.1	8.49	2.71	3.95	12.8	4.10
Cfs	5.38	3.96	3.45	4.80	7.43	11.6	15.6	13.1	4.19	6.11	19.8	6.34
Ac-ft	331	243	205	295	442	715	962	729	258	364	1,220	377

Calendar Year 1964:	Max	26.3	Min	1.56	Mean mgd	4.92	Mean cfs	7.61	Ac-ft	5,520		
Fiscal Year 1964-65:	Max	120	Min	2.10	Mean mgd	5.48	Mean cfs	8.48	Ac-ft	6,140		

Peak discharge (base, 100 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-25	0500	2.82	163	252	5-2	about 1200	4.80	1,440	2,230
12-10	1430	3.06	207	320					
12-19	1130	3.05	205	317	5-4	1930	3.01	213	330
2-4	0400	4.77	1,350	2,090					

* Discharge measurement made on this day.
a No gage-height record.

2949. Waikane Stream at altitude 75 ft, at Waikane

Location.--Lat 21°30'00", long 157°51'54", on right bank 0.3 mile downstream from Waikeekee Stream, 0.7 mile west of Waikane, and 1.2 miles northwest of Waiahole School.

Drainage area.--2.22 sq mi.

Records available.--December 1959 to June 1965.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 75 ft (from topographic map).

Average discharge.--5 years (1960-65), 5.51 mgd (8.53 cfs).

Extremes.--Maximum discharge during year, 5,690 mgd (8,800 cfs) Feb. 4 (gage height, 10.76 ft), from rating curve extended above 74 mgd on basis of slope-area measurements at gage heights 4.88, 9.46, and 10.76 ft; minimum, 1.56 mgd (2.41 cfs) Oct. 3.
1959-65: Maximum discharge, that of Feb. 4, 1965; minimum, 0.77 mgd (1.19 cfs) Oct. 10, 11, 1962.

Remarks.--Records good except those for period of no gage-height record, which are poor. Continuous records of rainfall are obtained at station.

Rating table (gage height, in feet, and discharge, in million gallons a day)

1.4	1.26	2.5	54.0
1.5	2.45	3.0	106
1.6	4.20	3.5	175
1.7	6.40	4.0	263
1.9	13.0	5.0	500
2.1	23.5	6.0	840

Discharge, in million gallons a day, fiscal year

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.04	3.80	2.16	2.04	17.8	5.52	5.74	2.59	3.60	3.23	28	8.3
2	2.04	3.60	2.16	1.79	56.9	5.74	5.30	2.59	3.80	2.89	130	5.6
3	2.04	3.40	2.16	2.16	14.5	5.30	5.08	10.3	3.60	3.05	55	5.3
4	2.04	3.23	2.16	1.79	11.9	5.08	4.86	*561	3.23	2.89	44	5.6
5	2.04	3.40	2.16	2.45	12.9	4.86	5.08	*120	3.05	3.80	26	5.0
6	2.16	3.23	2.16	9.94	9.40	4.64	4.64	32.2	2.89	20.8	22	4.8
7	2.04	3.05	2.04	20.1	14.8	4.42	4.64	19.6	2.89	*6.34	18	4.6
8	2.04	8.84	2.04	4.86	10.5	4.42	4.20	22.7	2.89	4.42	24	4.4
9	2.74	4.20	2.45	3.60	*10.3	6.79	4.00	16.0	2.89	4.42	14	4.2
10	2.04	3.05	2.16	3.05	8.50	45.2	8.22	11.2	4.93	4.42	11	4.0
11	4.29	2.74	2.16	3.23	7.00	*20.8	4.42	9.40	5.30	4.20	10	4.0
12	3.23	2.74	2.16	2.59	6.70	11.6	3.80	8.20	3.80	3.80	12	4.5
13	2.16	*2.64	2.16	2.45	6.40	15.0	4.64	7.30	3.40	3.80	9.0	4.5
14	2.04	3.05	2.16	2.89	32.7	9.10	3.80	6.70	3.05	3.80	17	4.5
15	2.16	2.74	2.16	3.05	8.50	21.2	3.60	6.18	3.05	3.40	28	4.2
16	3.05	3.70	3.40	2.59	7.90	19.3	3.40	5.74	2.89	3.23	22	4.2
17	2.45	3.40	2.89	6.99	7.30	12.3	3.40	5.30	2.89	3.23	12	3.0
18	2.04	2.89	2.16	26.9	7.60	8.80	3.40	5.08	3.05	3.23	9.0	3.0
19	2.89	2.59	2.04	23.8	12.5	58.1	3.23	4.86	2.89	5.91	8.0	4.3
20	2.16	2.59	2.28	10.1	23.4	16.5	3.23	4.64	2.59	9.24	8.5	3.0
21	6.00	2.59	2.04	9.33	10.5	20.3	3.23	4.64	3.05	4.64	9.0	3.4
22	3.80	2.45	2.58	5.74	8.80	15.0	3.05	4.64	2.59	6.30	7.5	*4.8
23	27.0	2.45	*2.70	5.30	8.50	32.1	3.23	4.42	2.59	6.18	7.0	2.89
24	12.3	2.45	4.30	4.86	7.30	14.0	15.3	4.42	2.89	5.74	6.5	2.89
25	85.6	2.59	2.89	4.42	6.70	11.6	5.30	4.00	2.59	5.08	6.3	2.89
26	11.2	2.45	2.16	4.20	11.0	9.76	3.60	3.80	2.45	5.52	8.0	2.89
27	7.00	2.59	2.04	3.80	8.80	8.50	3.23	3.80	2.28	8.78	6.5	2.89
28	5.52	3.23	1.91	3.60	6.70	7.90	3.05	3.60	2.28	*18	6.2	2.89
29	5.08	2.45	2.04	8.04	6.18	7.00	3.05	---------	2.28	30	8.0	2.59
30	4.64	2.28	1.91	4.86	5.74	6.40	3.74	---------	8.36	13	9.0	2.59
31	4.20	2.16	---------	12.0	---------	5.96	3.74	---------	5.30	---------	7.0	---------
Total	220.03	96.57	69.79	202.52	367.72	423.19	139.20	894.90	103.34	203.34	588.5	121.72
Mean												
Mgd	7.10	3.12	2.33	6.53	12.3	13.7	4.49	32.0	3.33	6.78	19.0	4.06
Cfs	11.0	4.83	3.61	10.1	19.0	21.2	6.95	49.5	5.15	10.5	29.4	6.28
Ac-ft	675	296	214	622	1130	1300	427	2750	317	624	1810	374

Calendar Year 1964: Max 99.1 Min 1.56 Mean mgd 6.85 Mean cfs 10.6 Ac-ft 7.700
Fiscal Year 1964-65: Max 561 Min 1.79 Mean mgd 9.40 Mean cfs 14.5 Ac-ft 10.540

* Discharge measurement made on this day.
Note.--No gage-height record Apr. 28 to June 22.

Peak discharge (base, 300 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-25	0500	6.92	1,260	1,950	2-4	0330	10.76	5,690	8,800
12-10	1330	4.92	479	741	5-2	about 1400	8.39	2,130	3,300

2965. Kahana Stream at altitude 30 ft, near Kahana

Location.--Lat 21°32'38", long 157°53'07", on right bank 600 ft upstream from Kawa Stream, 1.1 miles southwest of Kahana, and 2.2 miles southwest of Swanzy Beach Park in Kaaawa.

Drainage area.--3.74 sq mi.

Records available.--December 1958 to June 1965. See also Note below.

Gage.--Water-stage recorder and concrete-masonry control. Altitude of gage is 30 ft (from topographic map).

Average discharge.--6 years (1959-65), 22.7 mgd (35.1 cfs).

Extremes.--Maximum discharge during year, 2,660 mgd (4,120 cfs) Feb. 4 (gage height, 7.18 ft), from rating curve extended above 350 mgd as explained below; minimum, 8.30 mgd (12.8 cfs) Sept. 13, 14, Mar. 29.
1958-65: Maximum discharge, 3,510 mgd (5,430 cfs) Apr. 15, 1963 (gage height, 8.10 ft), from rating curve extended above 350 mgd on basis of computation of peak flow over submerged weir; minimum, 6.50 mgd (10.1 cfs) Sept. 17, 18, 20, 1961.

Remarks.--Records fair. Approximately 6 mgd is diverted by Waiahole Water Co. at 800 ft elevation, 2.3 miles above station. Continuous records of rainfall are obtained at station.

Note.--Published records for high-water periods in fiscal years 1959 and 1960 have been found to be in error; revised records are on file in the district office and will be published in the next water-supply paper.

Rating table (gage height, in feet, and discharge, in million gallons a day)

1.4	5.60	2.1	67.5
1.5	9.70	2.5	145
1.6	15.1	3.0	290
1.8	30.8	4.0	650

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	9.70	15.1	10.2	23.3	130	15.8	20.8	13.4	11.7	15.8	77.4	23.9
2	10.2	14.6	9.70	11.7	233	21.5	22.2	13.4	13.6	14.0	609	19.4
3	9.70	12.8	9.70	13.4	57.7	14.0	33.2	31.8	15.8	29.3	218	18.6
4	9.20	12.2	9.70	10.7	81.6	14.0	20.8	559	11.2	18.6	164	19.4
5	9.20	16.5	13.6	16.3	76.3	13.4	20.1	173	11.2	47.0	77.4	17.9
6	10.7	12.8	10.7	72.3	41.0	12.8	18.6	47.2	13.4	125	56.3	17.2
7	9.70	11.7	9.20	77.8	59.4	12.2	17.2	34.9	11.7	41.0	49.8	17.9
8	9.70	44.7	9.20	24.8	34.9	13.4	17.2	104	14.0	29.1	65.5	16.5
9	14.0	17.9	14.0	19.4	51.2	35.0	15.8	44.8	11.7	39.5	40.0	15.8
10	10.2	13.4	10.2	16.5	30.8	85.2	43.5	29.9	19.1	43.1	32.8	*14.6
11	17.8	12.2	9.20	18.6	26.5	30.8	17.9	25.6	17.2	27.4	28.2	14.6
12	15.8	13.4	10.2	14.6	31.8	30.6	16.5	*23.9	14.0	23.1	29.1	15.1
13	11.2	*12.2	8.70	13.4	38.8	58.7	35.6	20.8	12.8	22.2	26.5	15.1
14	11.2	13.4	9.20	18.1	132	25.6	17.9	19.4	12.2	20.1	47.1	15.1
15	11.7	13.4	14.3	18.6	25.6	288	16.5	18.6	11.7	18.6	78.7	14.6
16	12.2	22.9	75.4	17.2	*22.2	95.4	15.8	17.9	12.2	17.2	61.4	14.6
17	10.2	22.6	15.4	59.8	20.8	49.8	15.1	16.5	11.7	16.5	40.3	13.4
18	9.70	14.6	11.7	78.7	20.8	36.9	15.1	15.8	12.2	15.1	31.8	13.4
19	15.5	14.0	10.7	63.6	46.5	126	14.6	15.1	11.7	15.8	28.2	15.1
20	10.2	13.4	18.0	32.8	47.0	48.2	14.0	15.1	10.7	24.2	29.1	13.4
21	23.4	12.8	15.6	53.4	23.1	*47.4	15.1	14.6	11.2	15.8	29.9	14.0
22	13.4	12.2	19.3	24.8	20.8	37.7	13.4	14.6	10.2	*15.1	24.8	17.9
23	91.0	12.8	*15.8	23.1	20.8	113	27.0	14.0	10.2	18.6	22.2	14.0
24	74.0	11.7	29.1	20.8	17.9	41.0	69.4	13.4	11.2	16.5	20.8	13.4
25	240	11.7	18.6	17.9	16.5	46.9	25.2	12.2	9.70	14.6	20.1	14.0
26	35.9	13.4	14.0	17.2	28.1	38.8	16.5	12.2	9.20	14.0	23.1	14.0
27	24.8	17.9	12.2	17.2	20.1	32.8	15.1	12.2	8.70	16.5	21.5	14.0
28	19.4	17.9	11.2	15.8	16.5	26.5	14.6	12.2	8.70	46.8	20.8	14.0
29	18.6	12.2	10.7	67.7	15.1	23.9	15.8	---------	8.30	94.5	23.1	12.8
30	17.9	11.2	15.9	21.5	14.6	23.9	14.0	---------	85.9	36.9	26.5	12.2
31	15.1	10.7	----------	160	----------	20.8	14.0	---------	26.9	----------	20.8	----------
Total	801.30	468.3	451.40	1061.0	1401.4	1480.0	648.5	1345.5	460.00	891.9	2044.2	465.9
Mean												
Mgd	25.8	15.1	15.0	34.2	46.7	47.7	20.9	48.1	14.8	29.7	65.9	15.5
Cfs	39.9	23.4	23.2	52.9	72.3	73.8	32.3	74.4	22.9	46.0	102	24.0
Ac-ft	2460	1440	1390	3260	4300	4540	1990	4130	1410	2740	6270	1430

Calendar Year 1964:	Max	288	Min	8.70	Mean mgd	30.5	Mean cfs	47.2	Ac-ft	34,240
Fiscal Year 1964-65:	Max	609	Min	8.30	Mean mgd	31.6	Mean cfs	48.9	Ac-ft	35,360

* Discharge measurement made on this day.

Peak discharge (base, 1,000 mgd, revised)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-25	0430	6.29	1,980	3,060	2-4	0330	7.18	2,660	4,120
11-14	0130	4.75	1,020	1,580	5-2	1200	6.88	2,420	3,740
12-15	1430	5.83	1,660	2,570					

3020. Punaluu ditch near Punaluu

Location.--Lat 21°33'41", long 157°54'11", on right bank 1,000 ft downstream from intake, 1.5 miles west of Kahana, and 1.7 miles southwest of Punaluu.

Records available.--May 1953 to June 1965.

Gage.--Water-stage recorder (digital). Altitude of gage is 200 ft (from topographic map).

Average discharge.--12 years, 7.36 mgd (11.4 cfs).

Extremes.--1953-65: Maximum daily discharge, 34.8 mgd (53.8 cfs) Oct. 31, 1964; no flow Dec. 7-11, 1963.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Ditch diverts from Punaluu Stream for irrigation of sugarcane in the Punaluu area.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	13.3	11.7	11.6	10.8	27.5	0.1	0.1	0.1	0.6	0.2	1.96	2.83
2	13.0	12.4	11.6	9.85	8.12	.1	.1	.1	.41	.2	2.31	1.05
3	12.8	12.8	11.6	9.55	9.70	.1	.1	.5	.35	.2	.43	.70
4	12.5	12.7	11.4	10.6	6.16	.1	.1	2.8	.35	.2	.47	.69
5	12.7	13.5	11.4	13.2	1.44	.1	.1	.1	.32	.2	.08	.67
6	12.8	12.7	11.2	16.5	1.26	.1	.1	.1	.26	.15	.07	.56
7	12.7	12.4	10.9	17.1	1.04	.1	.1	.1	.24	.02	.06	.46
8	12.7	13.6	10.9	15.0	.7	.1	.1	.1	.24	.04	.06	9.63
9	12.8	14.4	11.4	15.2	.6	.4	.1	.1	.24	.05	.06	13.5
10	12.8	16.2	10.9	15.0	.5	1.8	.1	*.04	.24	.06	.06	13.4
11	13.2	11.9	10.8	15.8	.4	.3	.1	.04	.24	.03	.06	13.6
12	12.5	*11.2	10.8	16.2	.5	.1	.1	.03	.21	.29	.08	13.1
13	10.4	10.8	10.9	17.3	.7	.1	.1	.03	.24	.2	1.00	12.0
14	10.4	10.8	11.1	18.2	2.0	.5	.1	.02	.24	.2	1.67	11.8
15	10.6	10.8	11.4	19.1	.5	2.5	.1	.02	10	.2	.51	11.9
16	10.8	11.4	12.7	19.3	*.4	.4	.1	.02	12	.2	.07	12.4
17	10.6	13.3	10.9	22.5	.3	.2	.1	.02	13	.2	.09	11.2
18	10.9	11.9	10.6	27.0	.35	.1	.1	.02	12	.2	.09	*11.4
19	11.2	12.5	10.6	28.5	.35	2.0	.1	.02	13	.2	.08	12.5
20	10.8	12.8	11.4	15.0	.32	.1	.1	.02	12	.3	.08	12.4
21	10.6	12.8	11.7	11.4	.35	*.1	.1	.02	12	.3	.09	12.6
22	10.6	12.8	*12.2	11.6	.32	.1	.1	.35	12	.2	.11	13.2
23	15.4	12.0	11.9	11.7	.29	.1	.1	.32	13	.2	.12	13.3
24	16.5	11.7	12.0	11.4	.29	.1	.7	.15	13	.2	.12	13.4
25	20.4	11.7	11.9	11.1	.3	.1	1.7	.11	12	.2	.12	13.3
26	14.0	11.9	11.2	10.9	.2	.1	.5	.41	11	.2	.25	13.2
27	12.5	12.0	10.9	11.1	.1	.1	.1	.4	11	*1.44	.37	13.1
28	11.9	12.4	10.3	23.0	.1	.1	.1	.7	11	2.95	.07	12.8
29	11.6	11.6	10.4	31.5	.1	.1	.1	---------	11	2.24	.07	12.7
30	11.4	11.6	11.1	28.5	.1	.1	.1	---------	.2	1.89	.09	12.5
31	11.4	11.6	---------	34.8	---------	.1	.1	---------	.2	---------	3.13	---------
Total	385.8	381.9	337.7	528.70	64.99	10.4	5.7	6.74	182.58	13.16	13.83	295.89
Mean												
Mgd	12.4	12.3	11.3	17.1	2.17	0.34	0.18	0.241	5.89	0.439	0.446	9.86
Cfs	19.2	19.0	17.5	26.5	3.36	0.53	0.28	0.373	9.11	0.679	0.690	15.3
Ac-ft	1180	1170	1040	1620	199	32	17	21	560	40	42	908

Calendar Year 1964:	Max	34.8	Min	0.06	Mean mgd	9.75	Mean cfs	15.1	Ac-ft	10,950
Fiscal Year 1964-65:	Max	34.8	Min	0.02	Mean mgd	6.10	Mean cfs	9.44	Ac-ft	6,830

* Discharge measurement made on this day.

Note.--No gage-height record Nov. 8-17, Nov. 25 to Feb. 9, Feb. 27 to Mar. 1, Mar. 15 to Apr. 5, Apr. 13-26.

3030. Punaluu Stream near Punaluu

Location.--Lat 21°33'33", long 157°54'06", on left bank at Punaluu ditch diversion dam, 1.4 miles west of Kahana, and 1.8 miles southwest of Punaluu.

Drainage area.--2.78 sq mi.

Records available.--May 1953 to June 1965. See also Note below.

Gage.--Water-stage recorder and masonry control. Altitude of gage is 212 ft (from topographic map).

Average discharge.--12 years, 9.34 mgd (14.5 cfs).

Extremes.--Maximum discharge during year, 1,920 mgd (2,970 cfs) Feb. 4 (gage height, 6.06 ft, from floodmarks), from rating curve extended above 110 mgd as explained below; minimum, 0.32 mgd (0.50 cfs) July 14, 18.
1953-65: Maximum discharge, 1,920 mgd (2,970 cfs) Nov. 1, 1961, and Feb. 4, 1965 (gage height, 6.06 ft), from rating curve extended above 110 mgd on basis of slope-area measurement of peak flow; no flow at times.

Remarks.--Records good except those for periods of no gage-height record and those below 0.5 mgd, which are poor. Records do not include flow of Punaluu ditch (see preceding page).

Note.--Published records for high-water periods in fiscal years 1956, 1957, and 1959 have been found to be in error; revised records are on file in the district office and will be published in the next water-supply paper.

Rating table (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used Aug. 9-12)

0.1	0.19	0.9	19.0
.2	.76	1.3	50.0
.3	1.68	1.5	82.0
.5	4.90	2.0	195
.7	10.0	2.5	355

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.62	2.07	1.27	3.45	25.6	16.5	23.9	17	14.5	16.0	60.2	17.0
2	.55	1.68	1.18	1.93	73.1	16.5	28.7	17	18.0	16.0	311	17.5
3	.49	1.47	1.27	2.22	34.4	16.0	26.0	36	19.0	20.2	109	18.0
4	.49	1.18	1.27	1.80	46	15.5	23.2	280	17.5	17.0	89.1	18.0
5	.49	2.23	1.27	3.19	44	15.5	22.5	90	19.0	27.8	39.3	18.0
6	.55	1.37	1.18	9.50	36	15.0	21.8	36	27.0	51.3	33.0	17.5
7	.49	1.27	1.18	13.6	40	14.5	21.1	28	18.5	25.3	28.8	17.5
8	.43	3.69	1.09	3.32	36	15.0	20.4	80	20.4	21.1	35.2	7.91
9	.62	1.71	1.68	2.37	32	40.6	19.7	38	17.5	23.9	26.7	3.80
10	.49	1.00	1.37	1.93	28	59.3	36.0	*28.1	17.5	23.9	23.9	3.64
11	.94	1.09	1.37	2.52	20	30.9	20.4	26.0	19.0	19	22.5	3.80
12	.76	*1.13	1.47	1.57	24	26.0	19.7	23.9	17.0	17	23.2	3.80
13	.43	1.00	1.09	1.47	32	32.7	33.1	22.5	17.0	15	20.4	3.80
14	.43	1.09	.92	2.06	90	25.3	21.1	21.8	16.5	15	33.2	3.80
15	.49	1.09	1.09	2.37	24	264	20.4	21.1	7.06	15	78.4	3.80
16	.69	1.49	6.78	1.93	*20	67.9	19.0	21.1	3.16	14	30.9	3.64
17	.49	4.74	2.52	6.80	18	35.1	18	20.4	3.00	14	28.1	3.48
18	.43	2.22	2.07	29.5	17.0	28.8	18	19.7	3.16	14	25.3	*3.32
19	.69	2.68	2.22	20.4	21.4	102	18	19.7	3.00	14	23.9	3.32
20	.49	3.16	3.38	16.4	24.9	37.0	17	19.0	2.84	18	24.6	3.16
21	2.01	3.16	1.18	21.1	18.5	*38.1	19	19.0	2.84	15	23.9	3.00
22	1.09	3.00	*2.03	15.5	18.0	39.3	17	18.5	2.84	15	21.8	3.48
23	12.3	1.93	1.93	15.0	19.0	78.1	28	18.0	3.00	16	21.1	2.52
24	13.4	1.57	2.37	13.2	17.0	33.7	50	18.5	3.00	14	21.1	2.52
25	67.8	1.57	2.07	12.4	16.5	63.4	22	18.0	2.84	14	21.1	2.52
26	7.84	1.57	1.37	12.4	24.4	35.7	20	17.5	2.68	14	21.8	2.52
27	4.90	2.46	1.18	13.9	19.0	30.2	19	17.0	2.68	*13.6	21.1	2.68
28	3.80	2.22	1.09	5.22	17.0	27.4	18	12.4	2.68	22.4	20.4	2.52
29	3.32	1.57	1.00	16.5	16.5	25.3	20	---------	2.68	48.8	20.4	2.22
30	2.84	1.47	1.58	4.70	16.5	23.9	18	---------	14.6	23.7	21.8	2.22
31	2.22	1.37	---------	34.9	---------	23.2	18	---------	13.8	---------	16.8	---------
Total	132.58	59.25	51.47	293.15	868.8	1,292.4	697.0	1,004.2	334.26	594.0	1,298.0	200.97
Mean												
Mgd	4.28	1.91	1.72	9.46	29.0	41.7	22.5	35.9	10.8	19.8	41.9	6.70
Cfs	6.62	2.96	2.66	14.6	44.9	64.5	34.8	55.5	16.7	30.6	64.8	10.4
Ac-ft	407	182	158	900	2,670	3,970	2,140	3,080	1,030	1,820	3,980	617

Calendar Year 1964:	Max	264	Min	0.27	Mean mgd	12.9	Mean cfs	20.0	Ac-ft	14,460		
Fiscal Year 1964-65:	Max	311	Min	0.43	Mean mgd	18.7	Mean cfs	28.9	Ac-ft	20,950		

Peak discharge (base, 500 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-25	0330	4.08	1,030	1,590	12-23	1100	3.09	576	891
11-14	about 0130	5.98	1,880	2,910	2- 4	about 0330	6.06	1,920	2,970
12-10	1300	3.33	672	1,040	5- 2	1130	5.37	1,590	2,460
12-15	1530	5.52	1,650	2,550	5- 4	1930	4.13	1,060	1,640
12-19	1130	3.98	980	1,520	5-15	0400	4.20	1,090	1,690

* Discharge measurement made on this day.
Note.--No gage-height record Nov. 4-17, Jan. 17 to Feb. 9, Apr. 11-26.

3089.9 Malaekahana Stream near Laie

Location.--Lat 21°38'09", long 157°57'54", on left bank 2.3 miles southwest of Laie Temple and 3.0 miles south of Kahuku School.

Drainage area.--0.64 sq mi.

Records available.--July 1963 to June 1965.

Gage.--Water-stage recorder. Altitude of gage is 450 ft (from topographic map).

Extremes.--Maximum discharge during year, 283 mgd (438 cfs) May 3 (gage height, 5.34 ft from floodmark in well), from rating curve extended above 4.3 mgd as explained below; no flow Sept. 8.
1963-65: Maximum discharge, 323 mgd (500 cfs) Jan. 6, 1964 (gage height, 5.54 ft), from rating curve extended above 4.3 mgd on basis of slope-area measurement at gage height 4.89 ft; no flow Nov. 25, Dec. 4, 5, 1963, Sept. 8, 1964.

Remarks.--Records good except those for periods of no gage-height record, which are poor. No diversion above station.

Rating tables (gage height, in feet, and discharge, in million gallons a day)

July 1 to Feb. 3

1.33	0	1.7	0.31
1.4	.01	1.8	.58
1.5	.06	1.9	1.03
1.6	.14		

Note.--Same as following table above 1.9 ft.

Feb. 4 to June 30

1.5	0.03	2.1	2.70
1.6	.10	2.3	5.65
1.7	.25	2.6	12.2
1.8	.55	3.0	26.5
1.9	1.03	3.5	54.0
2.0	1.70		

Discharge, in million gallons a day, fiscal year

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.19	0.07	0.03	0.20	16	0.21	0.49	0.31	0.19	0.10	5.2	0.44
2	.11	.07	**.03	.10	22	.94	1.77	.27	.89	3.24	24	.29
3	.08	.10	.03	.07	1.5	.36	1.14	1.63	1.22	7.44	34	.21
4	.07	*.07	.02	.07	4.6	.25	.55	45.9	.25	.75	16	*.34
5	.06	.07	.01	*.06	14	.20	.43	27.7	6.11	15.7	1.3	.27
6	.15	.08	.01	6.55	2.0	.19	1.93	2.46	.91	12.0	.8	.19
7	.19	.11	.01	*5.41	1.2	.17	*.54	5.84	.32	1.72	.7	.17
8	.11	.98	0	.31	4.0	.17	.46	15	.23	.59	1.1	.15
9	.07	.37	.01	.14	.8	*9.55	.38	3.7	.17	2.06	.7	.14
10	.07	.12	.04	.07	1.3	14.7	8.64	.8	.15	1.70	.6	.13
11	.07	.08	.03	.08	.6	*1.98	.78	.7	.14	.47	.5	.13
12	.26	.07	.08	.07	1.0	1.43	.52	.6	.13	.29	.4	.13
13	.14	.11	.10	.06	.7	5.98	1.40	.6	.14	2.96	.5	.13
14	.12	.56	.07	.05	.6	6.98	.55	.5	.14	1.06	2.2	.13
15	.11	.51	.25	1.72	.5	22.7	.38	.5	.13	.38	13	.15
16	.48	.29	3.52	.21	.5	18.3	.33	.9	.13	*.32	.9	.15
17	.25	.88	1.47	1.19	.4	3.88	.31	.5	.14	.23	1.2	.14
18	.12	.19	.76	15	.5	1.27	.29	.5	.13	.19	.7	.13
19	.10	.88	.17	3.8	*3.38	11.7	.23	.5	.12	.2	.6	.13
20	.07	.17	1.58	.7	2.89	1.47	.23	.4	.12	.3	.5	.17
21	2.36	.09	.25	.6	.70	2.38	4.55	.4	.10	.3	.5	.15
22	.43	.07	.23	.4	.46	1.21	.74	.3	.10	.2	.4	.38
23	8.00	.06	.67	.3	3.80	30.6	.38	.3	.10	.2	.3	.29
24	1.94	.04	.38	.3	.70	2.17	3.49	.3	.10	.2	.3	.17
25	9.66	.04	.49	.3	.40	6.66	1.85	.6	.09	.2	.3	.12
26	.49	.04	.17	.2	.40	1.54	.46	*.23	.08	.3	.5	.11
27	.20	.03	.09	.4	.49	1.21	*.33	.21	.08	.3	*.27	.10
28	.12	.81	.07	.2	.29	.92	.29	.19	.08	4.5	.23	.15
29	.09	.15	.06	4.5	.25	.66	4.93	---------	.08	6.0	.60	.17
30	.07	.07	.11	.5	.21	.58	.62	---------	.10	.6	1.23	.10
31	.07	.04	---------	14	---------	.55	.38	---------	.13	---------	.35	---------
Total	26.25	7.22	10.74	57.56	86.17	150.91	39.37	111.84	12.80	64.50	109.88	5.46
Mean												
Mgd	0.847	0.233	0.358	1.86	2.87	4.87	1.27	3.99	0.413	2.15	3.54	0.182
Cfs	1.31	0.361	0.554	2.88	4.44	7.54	1.96	6.17	0.639	3.33	5.48	0.282
Ac-ft	81	22	33	177	264	463	121	343	39	198	337	17

Calendar Year 1964:	Max	40	Min	0	Mean mgd	1.63	Mean cfs	2.52	Ac-ft	1.830
Fiscal Year 1964-65:	Max	45.9	Min	0	Mean mgd	1.87	Mean cfs	2.89	Ac-ft	2.100

Peak discharge (base, 100 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-25	0430	4.72	182	282	12-23	0930	4.72	182	282
10-18	about 1700	4.54	157	243	2- 5	0530	5.29	273	422
					4- 3	1400	4.22	117	181
12- 9	1800	4.89	209	323	4- 5	1600	4.28	124	192
12-16	1830	4.79	193	299	5- 3	about 1000	5.34	283	438
12-19	1130	4.06	101	156					

* Discharge measurement made on this day.
** Field estimate made on this day.
Note.--No gage-height record Oct. 18 to Nov. 18, Feb. 8-25, Apr. 19 to May 26.

3250. Kamananui Stream at Pupukea Military Road, near Maunawai

Location.--Lat 21°37'25", long 158°01'04", on right bank 75 ft upstream from Pupukea Military Road and 3.5 miles southeast of Maunawai.

Drainage area.--3.13 sq mi.

Records available.--Occasional low-flow measurements, fiscal years 1961-63; June 1963 to June 1965.

Gage.--Water-stage recorder and culvert control. Altitude of gage is 590 ft (from topographic map).

Extremes.--Maximum discharge during year, 844 mgd (1,310 cfs) Feb. 4 (gage height, 8.23 ft), from rating curve extended above 28 mgd on basis of slope-area measurement at gage height 8.12 ft; minimum, 0.61 mgd (0.94 cfs) July 19, Sept. 6-9, 29, 30.
1963-65: Maximum discharge, that of Feb. 4, 1965; minimum, 0.46 mgd (0.71 cfs) Dec. 4, 5, 25, 26.

Remarks.--Records good. No diversion above station. Continuous records of rainfall are obtained at station.

Rating tables (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used Dec. 16-19, Jan. 10-15, Feb. 9-27)

July 1 to Feb. 3

0.5	0.32	1.1	5.85
.6	.76	1.5	13.2
.7	1.40	2.0	26.5
.8	2.27	2.5	45.0

Note.--Same as following table above 2.5 ft.

Feb. 4 to June 30

0.5	0.75	2.5	45.0
.6	1.38	3.0	70.0
.7	2.25	4.0	140
1.0	5.40	5.0	245
1.5	14.3	6.0	390
2.0	27.5		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.00	1.82	0.81	2.09	70.8	2.58	6.32	1.64	2.34	0.75	28.3	4.06
2	1.05	2.68	*.76	1.26	115	5.44	5.85	1.40	4.17	19.9	140	3.20
3	.99	1.40	.81	.93	17.0	2.99	6.00	5.18	9.45	42.0	179	2.44
4	.81	1.05	.87	.87	30.5	2.48	4.90	258	3.20	5.02	37.4	*3.30
5	.76	1.05	.70	135	56.6	2.18	4.64	140	5.40	108	19.2	3.10
6	2.12	2.56	.66	*34.0	19.0	2.09	12.5	22.6	4.52	104	10.5	2.16
7	2.00	1.26	.61	*36.9	15.5	1.91	4.77	26.1	2.72	15.6	9.28	1.80
8	1.26	5.84	.61	3.66	28.9	2.00	3.78	58.5	2.34	6.60	13.7	1.71
9	1.05	3.34	.70	2.09	11.2	*57.0	3.42	23.5	2.07	10.9	9.28	1.62
10	.93	1.19	1.19	1.56	13.2	80.3	31.4	10.1	1.89	12.3	6.45	1.54
11	.81	.87	.99	1.64	7.74	15.7	3.66	7.92	2.25	4.65	5.40	*1.38
12	1.19	1.05	1.12	1.19	9.58	10.8	2.68	6.90	1.98	3.86	4.90	1.38
13	1.05	1.26	1.12	.93	8.93	41.6	8.57	6.00	1.71	14.8	4.78	1.62
14	.70	4.70	1.05	.93	6.94	11.4	3.09	5.28	1.71	7.86	17.9	1.71
15	1.06	3.30	2.00	8.69	5.44	93.4	2.33	4.90	1.62	3.86	47.5	1.80
16	3.08	2.37	18.3	2.18	*5.08	95.9	1.73	5.02	1.54	*3.30	9.60	*1.71
17	2.00	9.73	6.80	4.89	4.14	*24.1	1.64	4.65	1.46	2.82	10.5	1.89
18	.87	3.09	9.61	56.7	6.50	9.67	1.48	3.96	1.46	2.63	5.15	1.38
19	.61	5.69	1.91	26.5	12.8	84.7	1.33	3.68	1.31	2.44	4.40	2.04
20	1.47	2.27	6.83	7.24	12.0	14.1	1.26	3.48	1.10	2.34	4.06	1.98
21	16.1	1.48	2.18	6.62	5.31	18.5	9.43	3.30	1.10	*2.16	3.77	1.97
22	4.38	1.26	1.64	3.90	4.26	12.3	3.09	3.48	1.10	2.07	3.48	4.86
23	42.5	1.19	1.56	3.42	17.0	188	1.56	3.20	1.10	1.98	3.20	2.88
24	18.0	1.12	2.76	2.89	5.85	22.1	20.7	3.10	1.89	1.98	3.01	1.71
25	68.7	1.12	3.84	2.37	3.90	32.1	16.3	4.06	1.62	1.89	*3.01	*1.38
26	6.94	1.26	1.26	2.09	4.02	15.0	2.37	2.92	1.03	2.07	5.09	1.17
27	3.54	1.05	.81	2.68	4.64	16.0	1.82	*2.90	.85	3.01	3.86	1.24
28	*2.52	2.85	.70	1.91	3.09	10.6	1.73	2.72	.80	29.0	3.30	3.26
29	2.09	1.33	.61	28.8	2.89	8.25	11.4	---------	.80	30.5	4.43	2.03
30	1.82	.99	.87	4.26	2.58	8.08	2.68	---------	.80	6.30	7.67	1.17
31	1.48	.81	---------	61.3	---------	7.09	1.91	---------	.80	---------	3.39	---------
Total	193.88	70.98	73.68	315.84	510.39	898.36	184.34	624.49	66.13	454.59	611.51	63.49
Mean												
Mgd	6.25	2.29	2.46	10.2	17.0	29.0	5.95	22.3	2.13	15.2	19.7	2.12
Cfs	9.67	3.54	3.81	15.8	26.3	44.9	9.21	34.5	3.30	23.5	30.5	3.28
Ac-ft	595	218	226	969	1,570	2,760	566	1,920	203	1,400	1,880	1,950

Calendar Year 1964: Max 188 Min 0.56 Mean mgd 8.58 Mean cfs 13.3 Ac-ft 9,640
Fiscal Year 1964-65: Max 258 Min 0.61 Mean mgd 11.1 Mean cfs 17.2 Ac-ft 14,260

* Discharge measurement made on this day.

Peak discharge (base, 400 mgd, revised)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
12- 9	1800	8.12	814	1,260	2-4	0700	8.23	844	1,310
12-16	1830	7.58	676	1,050	2-8	1900	6.12	409	633
12-19	1230	6.40	454	702	4-3	1300	6.48	467	723
12-23	1000	7.33	626	969	5-3	1030	7.58	676	1,050
1-24	2230	6.08	403	624					

3300. Kamananui Stream at Maunawai

Location.--Lat 21°38'20", long 158°03'27", on right bank at Maunawai, 25 ft upstream from Elehaha Stream, 4.9 miles northeast of Waialua School, and 7.3 miles southwest of Kahuku School.

Drainage area.--9.79 sq mi.

Records available.--February 1958 to June 1965. See also Note below.

Gage.--Water-stage recorder (digital July 1 to May 12) and concrete control (prior to May 13). Altitude of gage is 20 ft (from topographic map). Prior to May 13, 1965, at datum 1.00 ft higher.

Average discharge.--7 years, 10.1 mgd (15.6 cfs).

Extremes.--Maximum discharge during year, 1,960 mgd (3,030 cfs) Feb. 4 (gage height, 7.65 ft), from rating curve extended above 210 mgd as explained below; minimum, 0.18 mgd (0.28 cfs) Sept. 8, 9.
1958-65: Maximum discharge, 2,230 mgd (3,450 cfs) Apr. 15, 1963 (gage height, 7.92 ft), from rating curve extended above 210 mgd on basis of slope-area measurement at gage height 7.72 ft; no flow at times.

Remarks.--Records good except those for periods of no gage-height record, which are fair. No diversion above station.

Note.--Published records for high-water periods in fiscal years 1958-60 have been found to be in error; revised records are on file in the district office and will be published in the next water-supply paper.

Rating tables (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used Apr. 30 to May 3)

July 1 to May 12				May 13 to June 30	
1.2	0.10	2.5	28.0	0.9	1.26
1.3	.33	3.0	59.0	1.0	2.30
1.4	.74	3.5	102	1.1	7.94
1.5	1.37	4.0	162	1.2	24.3
1.6	2.27	4.5	245		
1.7	3.56	5.0	360		
1.9	7.00	5.5	520		
2.2	15.0				

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.55	1.89	0.44	0.85	106	3.35	9.46	3.64	2.92	0.90	22.1	4.5
2	1.37	2.44	*.45	1.09	169	6.27	8.64	3.12	2.79	50.6	358	3.5
3	1.05	1.80	.48	.69	29.6	5.30	8.99	9.25	13.3	84.0	441	3.0
4	.86	1.18	.43	.47	47.3	3.37	7.21	459	4.64	16.8	98.0	3.8
5	.70	1.23	.43	*.39	85.2	2.86	*6.54	227	9.67	180	36.6	3.5
6	.87	2.16	.30	31.0	41.0	2.58	16.0	46.4	7.72	198	13.0	2.7
7	1.84	1.68	.24	63.9	24.6	2.34	8.10	44.4	4.02	45.0	9.40	2.2
8	1.36	3.72	.20	6.68	62.5	2.37	5.89	54.8	2.79	16.0	15.4	1.9
9	.99	5.47	.19	2.97	19.3	96.1	5.02	47.1	2.40	16.0	12.1	1.8
10	.77	1.84	.28	2.17	21.6	130	41.5	17.1	2.18	24.5	5.48	1.6
11	.58	1.19	.72	1.96	11.5	33.5	8.98	13.6	2.27	9.40	3.56	*1.5
12	.52	1.01	.67	1.60	10.6	17.4	5.87	11.6	2.18	6.62	3.0	1.4
13	.83	1.41	.60	1.23	13.1	63.4	11.8	9.94	1.91	13.6	2.6	1.8
14	.59	3.21	.69	1.06	9.64	22.1	7.69	8.68	1.91	20.3	30	1.9
15	.55	4.27	.80	9.74	7.44	121	5.0	7.72	1.73	*7.00	90	2.1
16	1.53	3.58	17.8	4.56	5.96	176	3.5	7.24	1.55	5.48	15	*2.0
17	2.60	7.82	5.67	5.29	5.12	69.1	3.0	7.48	1.64	4.48	20	2.2
18	1.24	3.77	10.2	82.0	7.00	24.1	2.5	5.86	1.37	3.87	10	*1.54
19	.68	4.82	2.40	45.0	*17.0	127	2.1	5.29	1.37	3.43	7.2	1.62
20	*.84	2.82	6.24	12.6	25.9	30.6	2.0	4.95	1.30	3.0	6.3	2.55
21	15.9	1.50	2.92	7.59	8.47	32.5	13	4.48	1.23	2.6	5.6	1.73
22	5.76	1.16	1.46	5.33	5.92	26.9	6.0	4.64	1.23	2.3	5.4	6.32
23	54.6	.90	1.73	3.94	30.2	390	2.5	4.33	1.16	2.1	5.0	4.70
24	34.9	.82	2.27	3.40	13.4	53.4	34	*4.02	1.73	2.0	*4.7	1.73
25	76.0	.72	2.92	2.75	6.43	51.2	26	4.48	2.09	1.9	4.5	*1.46
26	11.2	.80	1.64	2.27	5.65	27.9	7.39	3.71	1.30	2.3	6.4	1.39
27	4.65	.75	.96	2.79	6.81	23.1	5.15	3.43	1.03	4.0	4.8	1.26
28	2.98	1.91	.59	2.12	4.56	17.3	4.23	3.30	.90	40	4.0	1.96
29	2.25	1.72	.47	29.3	3.82	13.1	25.0	---------	.90	*46	6.3	2.80
30	1.93	.96	.39	7.29	3.48	12.1	7.50	---------	.85	11.3	10	1.46
31	1.66	.58	---------	80.9	---------	11.1	4.43	---------	.96	---------	4.0	---------
Total	234.15	69.13	64.58	422.93	808.10	1597.34	304.99	1026.56	83.04	823.48	1259.44	71.92
Mean												
Mgd	7.55	2.23	2.15	13.6	26.9	51.5	9.84	36.7	2.68	27.4	40.6	2.40
Cfs	11.7	3.45	3.33	21.0	41.6	79.7	15.2	56.8	4.15	42.4	62.8	3.71
Ac-ft	719	212	198	1300	2480	4900	936	3150	255	2530	3870	221

Calendar Year 1964:	Max	390	Min	0.19	Mean mgd	12.5	Mean cfs	19.3	Ac-ft	14020
Fiscal Year 1964-65:	Max	459	Min	0.19	Mean mgd	18.5	Mean cfs	28.6	Ac-ft	20770

Peak discharge (base, 450 mgd, revised)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
12- 9	1930	6.62	1,090	1,690	2-4	0730	7.65	1,960	3,030
12-16	1930	6.70	1,150	1,780	4-5	1730	5.85	675	1,040
12-19	1330	5.82	660	1,020	5-3	1130	7.04	1,400	2,170
12-23	0830	7.40	1,710	2,650					

* Discharge measurement made on this day.
Note.--No gage-height record Jan. 15-25, Apr. 20-29, May 12 to June 17.

3450. Opaeula Stream near Wahiawa

Location.--Lat 21°33'55", long 158°00'10", on left bank 4.3 miles northeast of Leilehua High School in Wahiawa and 8.1 miles east of Waialua School.

Drainage area.--2.98 sq mi.

Records available.--August 1959 to June 1965. See also Note below.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 1,120 ft (from topographic map).

Average discharge.--5 years (1960-65), 9.22 mgd (14.3 cfs).

Extremes.--Maximum discharge during year, 1,810 mgd (2,800 cfs) Dec. 15 (gage height, 8.82 ft), from rating curve extended above 69 mgd on basis of slope-area measurement at gage height 6.74 ft; minimum, 0.56 mgd (0.87 cfs) Mar. 30.
1959-65: Maximum discharge, that of Dec. 15, 1964; minimum, 0.20 mgd (0.31 cfs) Dec. 9, 10, 1962.

Remarks.--Records good except those for periods of no gage-height record, which are poor.

Note.--Published records for high-water periods in the fiscal year 1960 have been found to be in error; revised records are on file in the district office and will be published in the next water-supply paper.

Rating table (gage height, in feet, and discharge, in million gallons a day)

1.4	0.45	2.3	10.5
1.5	.67	2.6	21.0
1.6	.97	3.0	46.0
1.7	1.37	3.5	100
1.8	2.00	4.0	190
2.0	3.90	4.5	290
2.1	5.60		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.96	6.0	0.91	15.5	84.4	2.60	6.65	2.0	1.05	1.25	45.9	3.80
2	1.50	3.5	.79	3.80	110	10.2	8.54	1.9	.91	.82	274	4.07
3	2.00	2.5	.76	2.77	15	3.80	19.6	5.4	11.9	.91	208	1.87
4	1.29	2.0	.73	2.26	30	2.43	6.02	170	3.38	5.26	58.1	1.56
5	1.50	6.0	.70	10.8	55	1.81	4.75	50	9.38	53.5	25.5	3.38
6	2.69	3.7	.70	53.4	28	1.50	12.8	15	37.8	113	9.38	2.43
7	3.28	2.1	.85	22	16	1.33	4.75	18	4.41	18.5	11.2	1.37
8	1.37	10	.82	8.0	14	1.33	3.38	40	3.28	4.75	12.9	1.62
9	1.68	3.5	.76	*3.17	26	41.5	2.86	12	2.69	12.9	9.66	1.17
10	2.96	2.7	3.90	2.52	13	46.0	30.0	6.0	1.33	16.7	4.24	1.01
11	1.37	2.2	1.50	3.38	10	23.5	4.92	4.3	9.94	4.24	3.38	.97
12	6.02	3.0	1.17	2.96	17	16.6	3.07	3.5	2.69	2.34	2.77	.85
13	2.60	3.6	.82	1.37	15	40.8	18.0	3.2	1.29	7.70	5.60	1.29
14	1.62	7.0	1.17	1.13	11	16.6	5.81	3.0	1.09	9.66	25.6	2.52
15	3.48	5.4	1.56	15.7	5.0	2.36	3.07	2.8	1.25	*2.52	98.2	2.43
16	6.02	8.0	33.3	3.80	3.7	57.2	2.69	2.7	.88	1.50	9.38	3.90
17	4.58	30	13.3	14.5	*3.17	20.3	2.4	2.5	.79	1.25	10.2	3.69
18	1.75	4.0	3.38	27.2	9.10	8.26	2.2	2.3	.73	1.17	4.24	1.25
19	4.92	9.0	2.69	32.7	19.8	96.5	2.0	2.1	.67	1.13	3.38	1.01
20	3.69	3.0	10.2	10.5	19.4	13.3	1.9	2.0	.67	.94	2.69	1.33
21	*38.0	2.5	3.80	23.9	6.44	26.7	4.0	1.8	.62	.85	7.98	1.17
22	11.7	2.2	3.17	6.02	4.24	48.3	2.1	2.4	.60	.85	3.28	5.09
23	83.7	2.0	3.38	8.82	10.2	120	10	1.8	3.59	.76	2.00	4.92
24	40	1.9	2.26	3.80	6.44	14.8	30	1.7	21.5	1.50	*2.00	2.09
25	100	1.8	2.09	2.96	3.69	67.9	9.0	1.7	4.58	1.56	1.56	3.38
26	8.0	2.0	1.56	2.43	17.4	16.5	3.4	*1.6	1.56	1.01	2.77	1.43
27	5.2	1.5	.91	5.26	12.3	18.3	2.9	*1.29	.94	3.07	5.43	1.17
28	4.2	5.0	.73	2.60	3.69	*11.2	2.5	1.13	.70	49.4	5.81	3.17
29	4.0	1.3	.73	13.7	2.60	6.44	5.4	---------	.62	91.3	4.41	2.77
30	3.9	1.2	10.8	5.60	2.26	6.44	2.4	---------	.67	14.4	12.5	1.17
31	3.2	*1.0	---------	65.1	---------	6.65	2.2	---------	2.34	---------	3.80	---------
Total	359.18	139.6	109.44	377.65	573.83	984.79	219.31	362.12	133.85	424.74	875.86	67.88
Mean												
Mgd	11.6	4.50	3.65	12.2	19.1	31.8	7.07	12.9	4.32	14.2	28.3	2.26
Cfs	17.9	6.96	5.65	18.9	29.6	49.2	10.9	20.0	6.68	22.0	43.8	3.50
Ac-ft	1,100	428	336	1,160	1,760	3,020	673	1,110	411	1,300	2,690	208

Calendar Year 1964: Max 236 Min 0.65 Mean mgd 12.0 Mean cfs 18.6 Ac-ft 13,450
Fiscal Year 1964-65: Max 274 Min 0.60 Mean mgd 12.7 Mean cfs 19.6 Ac-ft 14,200

Peak discharge (base, 700 mgd, revised)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
12-15	1430	8.82	1,810	2,800	5- 3	1100	6.40	795	1,230
2- 4	about 0700	7.28	1,110	1,720	5-15	0530	6.39	792	1,230
5- 1	2330	7.33	1,130	1,750					

* Discharge measurement made on this day.
Note.--No gage-height record July 24 to Aug. 31, Oct. 7, 8, Nov. 2-16, Jan. 17 to Feb. 26.

4000. Halawa Stream near Halawa

Location (revised).--Lat 21°09'31", long 156°45'53", on right bank 600 ft downstream from Hipuapua Stream and 1.5 miles west of Halawa.

Drainage area.--4.62 sq mi.

Records available.--July 1917 to July 1932, November 1937 to June 1965.

Gage.--Water-stage recorder. Altitude of gage is 210 ft (revised, from topographic map). Prior to June 25, 1923, at site 350 ft upstream at different datum.

Average discharge.--42 years (1917-32, 1938-65), 19.8 mgd (30.6 cfs).

Extremes.--Maximum discharge during year, 17,400 mgd (26,900 cfs) Feb. 4 (gage height, 19.91 ft, from floodmarks), from rating curve extended above 33 mgd on basis of slope-area measurement of peak flow; minimum, 2.56 mgd (3.96 cfs) Sept. 3.
1917-32, 1937-65: Maximum discharge, that of Feb. 4, 1965; minimum, 0.49 mgd (0.76 cfs) Nov. 23, 1962.

Remarks.--Records fair except those for periods of no gage-height record, which are poor. Small diversion above station by Maui County Board of Water Supply for domestic use at Halawa.

Rating tables (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used July 1 to Oct. 18, Dec. 20 to Jan. 17, Apr. 1-12)

July 1 to Feb. 3

1.2	2.25	2.6	34.0
1.3	2.70	3.0	68.0
1.6	4.85	3.5	135
1.9	8.80	4.0	240
2.2	16.0	4.5	390

Feb. 4 to June 30

1.6	2.58	4.0	100
1.8	4.40	5.0	215
2.1	8.40	6.0	390
2.5	17.4	7.0	660
3.0	35.7	8.0	1,010
3.5	63.0		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	9.37	17.0	3.12	5.69	385	7.83	9.56	6.4	4.3	*7.76	150	70.1
2	27.0	10.9	2.88	4.85	71.2	*32.3	10.8	13	9.4	7.12	46	14.6
3	15.7	5.58	2.61	10.2	24.0	6.94	13.3	55	26	6.41	34	6.80
4	9.18	4.51	8.57	21.2	24.9	5.06	14.2	*800	7.0	6.02	38	7.44
5	8.32	15.5	4.17	77.8	134	4.26	8.32	40	30	66.2	50	12.0
6	9.18	5.69	2.88	353	46.5	3.79	8.32	14	14	50.5	42	5.76
7	5.96	4.34	3.37	197	14.5	3.51	9.75	11	5.4	15.6	30	5.17
8	13.1	803	2.94	19.2	34.0	4.76	12.3	10	5.6	7.60	240	4.20
9	6.29	20.2	14.1	15.7	27.4	216	7.52	9.5	17	39.6	20	3.60
10	4.85	8.00	6.29	12.5	15.4	17.4	6.29	9.0	6.6	41.6	12	3.32
11	113	5.27	4.51	10.5	10.1	31.7	5.90	17	5.0	10.5	7.2	3.32
12	16.0	6.03	8.79	6.55	78.1	113	7.52	12	4.8	12.4	6.8	5.17
13	8.32	9.30	4.96	5.48	13.9	53.2	12.8	11	4.8	600	6.2	4.62
14	7.84	22.0	4.51	25.6	51.3	14.8	10.2	9.6	6.0	46	6.4	4.30
15	8.80	10.5	*6.42	38.5	10.7	57.2	7.52	9.0	4.3	8.5	6.6	4.51
16	5.58	36.2	25.5	43.6	8.64	117	5.90	14	4.2	7.2	6.6	5.50
17	4.68	32.8	28.7	36.1	6.55	34.5	*4.76	*12	4.0	6.0	5.0	3.90
18	4.42	7.84	17.2	130	8.48	10.9	4.5	9.4	4.0	5.4	*5.28	4.95
19	21.7	5.69	5.90	248	327	199	4.5	9.2	3.8	5.4	7.12	6.28
20	14.0	5.27	50.0	45.3	130	316	4.0	9.0	3.8	5.2	18.7	7.18
21	35.1	5.27	13.6	90.0	36.1	79.7	14	9.0	38	6.7	7.12	5.89
22	151	7.32	17.0	26.8	12.1	27.6	15	8.3	480	8.5	4.73	11.5
23	146	4.60	45.5	13.0	18.0	81.4	20	6.4	360	8.6	4.10	4.10
24	176	3.79	37.7	*20.0	58.6	19.5	16	80	36	5.3	3.70	3.15
25	60.3	3.12	10.3	10.3	8.99	34.5	8.6	32	7.8	5.0	5.27	4.40
26	13.9	3.00	11.2	10.5	10.7	16.0	12	8.8	6.3	4.6	14.1	14.6
27	9.56	29.8	5.90	8.00	7.52	14.2	8.2	7.0	5.8	4.6	9.71	11.6
28	8.16	21.1	12.9	6.94	5.69	12.3	6.0	6.0	5.2	260	5.76	13.6
29	7.52	5.06	8.84	29.5	5.06	10.3	9.6	---------	5.0	10	8.03	5.89
30	*15.1	3.86	16.8	34.5	4.68	34.4	34	---------	14	20	21.9	13.9
31	6.16	3.18	----------	180	----------	11.8	19	---------	6.4	----------	10.6	----------
Total	942.09	403.02	387.16	1,736.31	1,589.11	1,590.85	330.36	1,237.6	1,134.5	1,288.31	832.92	271.35
Mean												
Mgd	30.4	13.0	12.9	56.0	53.0	51.3	10.7	44.2	36.6	42.9	26.9	9.04
Cfs	47.0	20.1	20.0	86.6	82.0	79.4	16.6	68.4	56.6	66.4	41.6	14.0
Ac-ft	2,890	1,240	1,190	5,330	4,880	4,880	1,010	3,800	3,480	3,950	2,560	833

Calendar Year 1964: Max 385 Min 2.61 Mean mgd 27.1 Mean cfs 41.9 Ac-ft 30,390
Fiscal Year 1964-65: Max 800 Min 2.61 Mean mgd 32.2 Mean cfs 49.8 Ac-ft 36,040

Peak discharge (base, 950 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-24	0430	6.17	968	1,500	2-4	about 0900	19.91	17,400	26,900
11-24	2400	6.15	960	1,490					
12-12	1730	7.36	1,560	2,410	4-13	about 2000	15.37	7,990	12,400
12-20	0500	7.19	1,480	2,290					

* Discharge measurement made on this day.
Note.--No gage-height record Jan. 18 to Mar. 31, Apr. 13 to May 17.

4055. Waikolu Stream at altitude 900 ft, near Kalaupapa

Location.--Lat 21°08'43", long 156°55'18", on right bank 1.8 miles southwest of Haupu Bay, 2.3 miles upstream from mouth, and 5.2 miles southeast of Kalaupapa.

Drainage area.--1.99 sq mi.

Records available.--May 1956 to October 1961, July 1962 to June 1965.

Gage.--Water-stage recorder. Altitude of gage is 900 ft (from topographic map). Prior to July 1, 1962, at site 200 ft upstream at datum 6.14 ft higher.

Average discharge.--8 years, 6.43 mgd (9.95 cfs).

Extremes.--Maximum discharge during year, 1,960 mgd (3,030 cfs) Apr. 13 (gage height, 6.12 ft), from rating curve extended above 14 mgd on basis of approximate gage height for flood of Oct. 31, 1961; minimum, 0.51 mgd (0.79 cfs) Aug. 30 to Sept. 9, Sept. 27.
1956-61, 1962-65: Maximum discharge, that of Apr. 13, 1965; minimum, 0.32 mgd (0.50 cfs) Jan. 15, 16, 1963.
Flood of Oct. 31, 1961, reached a stage of 13.62 ft, from floodmarks, former site and datum (discharge, 4,020 mgd or 6,220 cfs, by slope-area measurement of peak flow).

Remarks.--Records good except those for periods of no gage-height record and those above 30 mgd, which are poor. Water diverted above station at times, either into or from Molokai tunnel.

Rating table (gage height, in feet, and discharge, in million gallons a day)

1.1	0	1.6	15.0
1.2	.63	1.8	29.4
1.3	2.30	2.1	60.0
1.4	5.50	2.5	122

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.40	0.90	0.51	0.76	40	1.8	1.8	7.75	1.5	2.30	9.0	16.3
2	27.1	*1.04	.51	.76	10	2.0	1.6	64.4	7.0	2.10	6.0	7.31
3	4.70	1.04	.51	.90	15	*2.10	1.9	77.2	26	2.10	5.5	2.55
4	4.00	1.04	.51	3.27	10	1.8	1.6	95.9	8.0	1.90	6.0	2.55
5	1.90	1.04	.51	27.8	60	1.6	1.6	9.10	3.0	6.34	4.5	2.80
6	1.72	1.04	.51	77.4	26	1.5	2.0	6.85	4.0	14.4	4.0	2.30
7	1.20	.90	.51	34.7	12	1.4	3.0	5.95	1.5	9.72	3.5	2.10
8	2.55	2.10	.51	2.80	20	1.5	4.5	2.80	1.4	3.40	3.0	2.10
9	1.36	1.90	.51	1.36	15	30	1.5	2.10	1.3	3.0	2.7	1.90
10	1.04	1.36	.76	1.04	8.0	15	2.0	23.0	1.2	2.5	2.5	1.72
11	1.72	1.04	.90	1.20	4.0	24	1.6	13.0	1.2	2.2	2.3	1.72
12	2.10	1.04	*.96	.90	4.5	46	1.5	3.10	1.2	2.0	2.2	1.72
13	1.54	2.10	.90	.76	4.5	20	5.0	1.90	1.4	70	2.2	1.90
14	1.04	4.30	.76	.76	4.5	10	3.0	1.54	1.7	15	2.2	2.10
15	1.20	1.90	.63	6.40	3.0	8.0	9.0	1.36	1.4	4.5	2.2	3.10
16	1.36	1.72	1.04	2.55	2.5	30	*18.4	27.3	1.2	3.0	2.1	3.40
17	1.04	8.61	3.10	2.55	2.0	16	7.30	12.4	1.0	2.8	2.1	2.10
18	.90	1.54	5.10	25.4	3.5	8.0	5.95	2.55	1.0	2.5	2.1	2.10
19	.90	1.20	1.54	46.8	50	30	4.70	2.80	1.0	2.2	*2.10	2.10
20	2.30	.90	2.80	13.9	24	120	4.00	2.80	.9	2.7	2.10	2.10
21	3.40	.76	1.36	19.1	10	26	48.2	2.3	.9	2.5	2.30	2.10
22	54.3	.76	.90	7.56	2.0	8.0	21.0	2.5	7.0	2.4	2.10	3.40
23	52.3	.63	.76	3.70	6.0	6.0	8.20	*3.40	90	2.3	2.10	2.30
24	35.9	.63	.63	2.30	7.0	3.5	12.0	13	70	2.2	2.10	1.90
25	4.70	.63	.63	*1.82	2.5	4.5	9.55	9.0	20	2.2	2.10	1.90
26	1.90	.63	.63	1.9	4.0	3.0	12.5	2.2	12	2.2	2.10	2.55
27	1.20	.63	.51	2.0	3.0	2.5	7.30	2.0	9.0	2.5	3.70	4.00
28	1.04	.63	2.11	1.8	2.5	2.2	5.10	1.7	6.0	40	2.80	12.6
29	1.04	.63	2.80	1.8	2.1	1.8	42.9	---------	4.5	15	2.30	4.70
30	1.04	.51	1.04	1.8	1.8	2.5	16.9	---------	3.0	9.5	2.80	7.32
31	.90	.51	---------	2.5	---------	2.2	19.3	---------	*2.10	---------	2.80	---------
Total	220.79	43.66	34.45	298.29	359.4	432.90	284.90	399.90	291.40	235.46	95.50	106.74
Mean												
Mgd	7.12	1.41	1.15	9.62	12.0	14.0	9.19	14.3	9.40	7.85	3.08	3.56
Cfs	11.0	2.18	1.78	14.9	18.6	21.7	14.2	22.1	14.5	12.1	4.77	5.51
Ac-ft	678	134	106	915	1,100	1,330	874	1,230	894	723	293	328

Calendar Year 1964:	Max	120	Min	0.51	Mean mgd	6.13	Mean cfs	9.48	Ac-ft	6,890		
Fiscal Year 1964-65:	Max	120	Min	0.51	Mean mgd	7.68	Mean cfs	11.9	Ac-ft	8,600		

* Discharge measurement made on this day.

Note.--No gage-height record Oct. 26 to Dec. 2, Dec. 4 to Jan. 15, Feb. 21, 22, Feb. 24 to Mar. 30, Apr. 9 to May 18.

Peak discharge (base, 250 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10- 6	0430	3.19	287	444	2- 4	0930	4.76	976	1,510
11- 5	about 1900	3.15	275	425	3-23	about 0400	6.03	1,880	2,910
12-20	about 0600	6.00	1,860	2,880	4-13	about 2000	6.12	1,960	3,030

4080. Waikolu Stream below pipeline crossing, near Kalaupapa

Location.--Lat 21°09'45", long 156°55'54", on left bank 0.7 mile upstream from mouth and 4.4 miles southeast of Kalaupapa Lighthouse.

Drainage area.--3.68 sq mi.

Records available.--July 1919 to November 1930, August 1931 to July 1932, September 1937 to January 1948, July 1948 to June 1965. Prior to August 1931, published as "at pipeline crossing, near Kalaupapa."

Gage.--Water-stage recorder. Datum of gage is 252 ft above mean sea level (hand levels by Bureau of Reclamation). Prior to Aug. 14, 1931, at site 500 ft upstream at different datums. Sept. 20, 1937, to Jan. 25, 1948, at present site at datum 1.49 ft higher and July 30, 1948, to June 30, 1962, at present site at datum 1.00 ft higher than present datum.

Average discharge.--36 years (1919-30, 1938-47, 1949-65), 12.1 mgd (18.7 cfs).

Extremes.--Maximum discharge during year, 1,800 mgd (2,790 cfs) Apr. 13 (gage height, 8.68 ft), from rating curve extended above 25 mgd as explained below; minimum, 3.30 mgd (5.11 cfs) Sept. 2-7, 9.

1919-32, 1937-65: Maximum discharge, 4,290 mgd (6,640 cfs) Oct. 31, 1961 (gage height, 13.75 ft, present datum, from floodmarks), from rating curve extended above 25 mgd on basis of slope-area measurement of peak flow; minimum, 1.3 mgd (2.0 cfs) Nov. 1, 2, 1925, June 5, 1926.

Remarks.--Records fair except those for periods of no gage-height record, which are poor. Diversion above station for domestic use in Kalaupapa and, since Nov. 16, 1960, water has been diverted above station both to and from Molokai tunnel.

Rating table (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used Apr. 14, 28, May 19 to June 30)

0.8	2.30	2.0	59.0
1.1	8.70	2.5	112
1.4	17.0	3.0	177
1.6	27.2	3.5	256

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	6.94	4.10	3.70	4.30	50.0	5.10	10.1	10.5	7.38	8.70	10	16.5
2	20.9	*4.10	3.50	4.10	17.1	6.50	9.85	43.4	13.8	8.48	15	11.0
3	8.04	3.90	3.50	4.30	21.5	*5.75	11.0	78.2	29.9	8.26	10	6.72
4	6.94	3.90	3.50	6.25	16.7	5.10	10.1	89.0	9.39	8.04	9.6	7.82
5	5.30	3.90	3.50	27.7	73.5	4.90	9.85	13.1	8.26	10.9	9.7	7.82
6	4.90	3.90	3.50	64.8	32.3	4.70	10.3	10.8	10.3	17.5	9.4	7.60
7	4.50	3.90	3.50	29.1	17.0	4.50	10.8	10.5	8.04	13.9	9.2	7.16
8	5.50	5.30	3.50	7.60	31.7	4.70	16.1	8.93	7.60	8.93	9.2	6.94
9	4.50	5.10	3.50	5.75	24.9	45.3	9.16	8.26	7.38	13.1	9.0	6.72
10	3.90	4.30	3.90	5.30	13.9	11.4	9.85	20.3	7.16	12.3	8.8	6.72
11	4.90	4.10	4.10	5.10	9.39	21.8	9.62	15.3	7.16	9.16	8.6	6.50
12	5.30	3.90	4.30	4.70	10.5	57.9	9.39	9.16	7.16	8.48	8.5	6.72
13	4.70	4.90	4.50	4.50	10.2	17.0	17.4	8.26	7.60	127	8.6	6.72
14	4.10	7.16	*3.90	4.90	10.4	8.93	12.0	7.82	8.93	29.9	8.4	6.72
15	4.30	4.70	3.90	8.78	7.16	7.82	12.3	7.60	8.26	9.5	8.0	7.60
16	4.50	4.50	4.50	6.94	6.50	42.8	*13.6	29.3	7.38	8.2	8.0	8.04
17	4.10	9.25	6.50	6.94	6.25	19.6	9.85	15.5	6.94	8.0	8.0	6.94
18	3.90	5.30	8.26	40.5	8.26	8.26	9.62	8.48	6.94	7.6	7.8	6.94
19	3.90	4.70	5.30	45.3	72.2	62.9	9.39	8.48	6.94	7.4	*7.60	6.94
20	5.30	4.30	6.25	15.3	37.5	126	9.16	8.70	6.94	7.2	7.38	6.72
21	6.50	3.90	5.10	16.3	26.2	38.6	43.1	8.04	6.72	7.0	7.60	6.72
22	48.9	3.90	4.50	10.7	8.48	20.6	19.2	8.70	34.5	7.3	7.60	8.26
23	45.6	3.90	4.30	8.04	14.7	18.9	10.5	*8.48	188	7.0	7.38	7.38
24	27.0	3.70	4.10	6.72	15.3	11.8	11.5	18.1	166	7.5	7.16	6.72
25	8.26	3.70	3.90	*6.00	6.94	14.6	10.5	13.0	27.2	6.9	7.16	6.50
26	5.75	3.70	3.90	7.16	10.6	11.0	11.5	9.39	9.5	6.7	7.16	7.38
27	4.90	3.70	3.70	6.00	8.48	10.5	10.1	9.39	9.0	6.5	8.54	8.04
28	4.50	3.90	5.30	4.90	6.25	10.3	9.39	7.60	8.7	65.7	8.04	12.7
29	4.30	3.90	6.72	5.10	5.50	10.1	38.5	---------	8.3	24	7.38	9.17
30	4.30	3.70	4.70	4.90	5.10	11.0	12.7	---------	8.5	16	7.82	10.3
31	4.10	3.70	---------	7.93	---------	10.5	14.7	---------	*8.93	---------	7.82	---------
Total	280.53	136.91	133.33	385.91	584.51	638.86	411.13	494.29	658.81	487.15	264.44	238.01
Mean												
Mgd	9.05	4.42	4.44	12.4	19.5	20.6	13.3	17.7	21.3	16.2	8.53	7.93
Cfs	14.0	6.84	6.87	19.2	30.2	31.9	20.6	27.4	33.0	25.1	13.2	12.3
Ac-ft	861	420	409	1,180	1,790	1,960	1,260	1,520	2,020	1,500	812	730

Calendar Year 1964:	Max	126	Min	3.50	Mean mgd	9.32	Mean cfs	14.4	Ac-ft	10,460
Fiscal Year 1964-65:	Max	188	Min	3.50	Mean mgd	12.9	Mean cfs	20.0	Ac-ft	14,460

Peak discharge (base, 450 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
12-20	0700	5.51	713	1,100	3-23	0400	6.48	1,000	1,550
2- 4	1000	5.56	728	1,130	4-13	2100	8.68	1,800	2,790

* Discharge measurement made on this day.

Note.--No gage-height record Mar. 26-30, Apr. 15-27, Apr. 29 to May 18.

4114. Kakaako Gulch near Mauna Loa

Location.--Lat 21°10'39", long 157°12'31", on left bank 1.0 mile downstream from Kamakahi Gulch and 3.0 miles north of Mauna Loa School.

Drainage area.--5.34 sq mi.

Records available.--July 1963 to June 1965.

Gage.--Water-stage recorder. Altitude of gage is 380 ft (from topographic map).

Extremes.--Maximum discharge during year, 430 mgd (665 cfs) Apr. 13 (gage height, 2.92 ft), from rating curve based on slope-area measurements at 0.72 and 1.43 ft, and extended above 120 mgd by logarithmic plotting; no flow most of the time.
1963-65: Maximum discharge, that of Apr. 13, 1965; no flow most of the time.

Remarks.--Records excellent except those for periods of flow, which are poor. No diversion above station. Continuous records of rainfall are obtained at station.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0	0	0.5	20.0
.1	2.60	.8	44.0
.2	5.60	1.2	89.0
.3	9.30		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1		(*)				*0		0	0	0		
2						0		0	0	*0		
3						0		0	0	3.98		
4						0		2.56	0	4.39		
5						0		3.58	0	.70		
6						0		1.30	0	0		
7						0		0	0	0		
8						0		5.65	0	0		
9						0		1.80	0	0		
10			(*)			*.38		3.54	0	0		
11						3.73		3.43	0	0		
12						1.30	(*)	1.30	0	0		
13						0		0	0	86.3		
14						0		0	0	34.8		
15						0		0	0	10.6		
16						0		*0	0	4.65		
17						0		0	0	2.00	(*)	
18						0		0	0	0		
19						0		0	.18	0		
20						0		0	0	0		
21						0		0	2.28	0		
22						0		0	0	0		
23				(*)		0		0	0	0		
24						0		0	0	0		
25						0		0	0	0		
26						0		0	0	0		
27						0		0	0	0		
28						0		0	0	0		
29						0		---	0	0		
30						0		---	0	0		
31			---		---	0		---	0	---		---
Total	0	0	0	0	0	5.41	0	23.16	2.46	147.42	0	0
Mean												
Mgd	0	0	0	0	0	0.175	0	0.827	0.079	4.91	0	0
Cfs	0	0	0	0	0	0.271	0	1.28	0.122	7.60	0	0
Ac-ft	0	0	0	0	0	17	0	71	7.5	452	0	0

Calendar Year 1964: Max 78.8 Min 0 Mean mgd 0.440 Mean cfs 0.681 Ac-ft 495
Fiscal Year 1964-65: Max 86.3 Min 0 Mean mgd 0.489 Mean cfs 0.757 Ac-ft 548

Peak discharge (base, 65 mgd)

Date	Time	Gage height	Discharge	
			Mgd	Cfs
4-13	1630	2.92	430	665

* Discharge measurement or observation of no flow made on this day.

4140. Kaunakakai Gulch at Kaunakakai

Location.--Lat 21°06'21", long 157°00'34", on left bank 0.6 mile upstream from Molokai Ranch pipeline crossing, 1.3 miles northeast of Kaunakakai Post Office, and 1.7 miles upstream from mouth.

Drainage area.--6.57 sq mi.

Records available.--December 1949 to June 1965. Prior to July 1958, published as Kaunakakai Stream at Kaunakakai.

Gage.--Water-stage recorder. Altitude of gage is 240 ft (from topographic map).

Average discharge.--15 years (1950-65), 1.01 mgd (1.56 cfs).

Extremes.--Maximum discharge during year, 1,650 mgd (2,550 cfs) Apr. 13 (gage height, 8.48 ft), from rating curve extended above 400 mgd as explained below; no flow for most of year.
1949-65: Maximum discharge, 1,980 mgd (3,060 cfs) Oct. 31, 1961 (gage height, 9.30 ft), from rating curve extended above 400 mgd on basis of slope-area measurement of peak flow; no flow for most of each year.

Remarks.--Records fair. No diversion above station. Since May 20, 1965, records include diversion from Molokai tunnel.

Rating table (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used Feb. 4-7, 17, Mar. 23-27, Apr. 13)

1.29	0	2.1	3.50
1.4	.05	2.3	6.20
1.5	.19	2.5	10.5
1.6	.41	2.8	21.0
1.7	.74	3.2	45.0
1.8	1.20	3.6	84.0
2.0	2.55	4.0	155

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0				0	0	0	0	0	0	0	0.04
2	0				0	0	0	4.80	0	0	0	.11
3	0				0	0	0	27.4	0	0	.08	.11
4	0	(*)			0	0	0	39.2	0	0	.26	.14
5	0				.01	*0	0	5.05	0	0	0	.19
6	0				8.89	0	0	1.00	0	0	.19	.19
7	0				0	0	0	.14	0	0	0	.13
8	0				.89	0	0	0	0	0	0	.03
9	0				1.01	0	0	0	0	0	0	.03
10	0				1.56	0	0	0	0	0	0	.01
11	0				0	0	0	0	0	0	0	.01
12	0				0	0	0	0	0	0	0	.01
13	0		(*)		0	1.55	0	0	0	1.37	0	.01
14	0				0	0	0	0	0	53.3	0	0
15	0				0	0	*0	0	0	2.54	0	0
16	0				0	0	0	0	0	.11	0	0
17	0				0	12.0	0	.37	0	0	0	0
18	0				0	.17	0	0	0	0	*0	0
19	0				0	18.4	0	0	0	0	0	0
20	0				1.41	125	0	0	0	0	.04	0
21	0				14.3	16.7	0	0	0	0	.08	.01
22	0			(*)	.64	4.79	1.09	*0	0	0	.06	0
23	0				.60	2.82	0	0	*108	0	.04	0
24	7.00				4.90	.29	0	0	84.2	0	.06	0
25	1.12				.12	0	0	0	9.79	0	.15	0
26	0				0	0	0	0	1.80	0	.18	0
27	0				0	0	0	0	.07	0	.13	0
28	0				0	0	0	0	0	13.5	.02	0
29	0				0	0	0	---------	0	3.11	.03	0
30	0				0	0	0	---------	0	0	.05	0
31	0		---------		---------	0	0	---------	0	---------	.05	---------
Total	8.12	0	0	0	34.33	181.72	1.09	77.96	203.86	209.56	1.42	1.02
Mean												
Mgd	0.262	0	0	0	1.14	5.86	0.035	2.78	6.58	6.99	0.046	0.034
Cfs	0.405	0	0	0	1.76	9.07	0.054	4.30	10.2	10.8	0.071	0.053
Ac-ft	25	0	0	0	105	558	3.3	239	626	643	4.4	3.1

Calendar Year 1964: Max 125 Min 0 Mean mgd 0.616 Mean cfs 0.953 Ac-ft 692
Fiscal Year 1964-65: Max 137 Min 0 Mean mgd 1.97 Mean cfs 3.05 Ac-ft 2210

* Discharge measurement or observation of no flow made on this day.

Peak discharge (base, 500 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
12-20	0700	7.25	1,160	1,790	4-13	2100	8.48	1,650	2,550
3-23	0930	5.57	571	883					

4150. East Fork Kawela Gulch near Kamalo

Location.--Lat 21°06'46", long 156°54'23", on left bank at Molokai Ranch pipeline intake, 4.7 miles northwest of Kamalo, and 7.6 miles northeast of Kaunakakai.

Drainage area.--0.45 sq mi.

Records available.--September 1946 to June 1965. Published as Right Branch of East Fork Kawela Stream near Kamalo prior to July 1958 and as Right Branch of East Fork Kawela Gulch near Kamalo July 1958 to June 1962. See also Note below.

Gage.--Water-stage recorder and concrete control. Datum of gage is 3,624.86 ft above mean sea level (Territorial Survey bench mark).

Average discharge.--18 years (1947-65), 1.54 mgd (2.38 cfs).

Extremes.--Maximum discharge during year, 711 mgd (1,100 cfs) Apr. 13 (gage height, 6.50 ft), from rating curve extended above 4.3 mgd as explained below; no flow for many days.

1946-65: Maximum discharge, 1,460 mgd (2,260 cfs), revised, Jan. 26, 1948 (gage height, 7.97 ft), from rating curve extended above 4.3 mgd on basis of slope-area measurement at gage height 6.50 ft; no flow at times each year.

Revisions.--The maximum discharge for the fiscal year 1962 has been revised to 298 mgd (461 cfs) Oct. 31, 1961 (gage height, 5.25 ft), superseding figure published in Surface Water Records of Hawaii and other Pacific Areas (1962).

Remarks.--Records fair except those for periods of no gage-height record, which are poor. Molokai Ranch diverts from gage pool.

Note.--Published records for peaks in fiscal years 1948 and 1951 have been found to be in error; revised records are on file in the district office and will be published in the next water-supply paper.

Rating table (gage height, in feet, and discharge, in million gallons a day)

2.34	0	3.0	3.35
2.4	.04	3.1	5.10
2.5	.21	3.2	8.10
2.6	.52	3.3	12.5
2.7	.98	3.5	25.5
2.8	1.59	3.7	44.0
2.9	2.36		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.66	0.02	0	0	14.2	0	0.14	0.44	0	0.8	2.90	5.10
2	3.92	.11	0	0	4.78	2.17	.09	8.96	2.6	.7	5.13	1.65
3	1.32	0	0	0	1.03	.38	1.66	10.6	4.4	.7	4.10	.21
4	2.02	0	0	1.21	6.50	*.02	.21	16.7	2.9	*.6	1.66	.35
5	.78	.02	0	4.26	22.0	0	.09	2.45	1.1	2.18	2.49	.67
6	.78	.01	0	7.55	5.84	0	.50	1.96	1.8	3.52	1.08	.24
7	.04	0	0	4.84	6.40	0	.98	1.20	.4	2.30	.64	.12
8	1.69	2.07	0	.38	11.1	.08	5.23	.73	.2	.23	.35	0
9	.10	.56	0	.01	7.92	9.60	.39	.21	0	3.74	.26	0
10	0	.03	.70	.11	2.93	1.30	.02	4.2	0	1.85	.07	0
11	.36	0	*.87	.26	1.32	2.73	0	3.5	0	.26	.02	0
12	.83	0	1.38	0	3.02	3.62	0	1.2	0	.01	.01	.37
13	.23	1.25	.26	0	2.21	2.32	*3.84	.6	0	*41.0	.07	.41
14	.17	1.66	.11	.13	1.71	.64	1.29	.4	0	3.73	.07	.62
15	1.52	.48	0	3.34	.26	.52	3.60	.3	0	.44	.73	1.82
16	.88	.79	.79	.93	.01	9.50	3.88	4.5	0	.03	.52	1.29
17	.15	2.33	1.64	.64	0	3.63	.64	3.5	0	0	.02	.44
18	0	.48	2.20	.17	0	.78	.48	.9	0	0	0	.73
19	.10	.17	.32	4.12	8.82	19.2	.05	.3	0	0	0	.93
20	.83	0	1.45	2.48	10.4	31.0	0	0	0	0	*.09	.64
21	1.95	0	.35	2.89	5.73	9.53	3.07	0	0	0	.46	.29
22	9.91	0	.19	1.28	1.08	6.60	2.45	0	2.8	0	0	1.38
23	9.52	0	0	*1.71	7.12	5.24	1.02	1.2	30	0	0	.44
24	7.86	0	0	1.08	3.23	1.02	1.79	*3.3	16	0	0	.03
25	1.82	0	0	.78	.56	3.32	.35	1.87	4.0	0	0	0
26	.78	0	0	1.58	1.19	.78	.78	1.04	3.5	0	0	.78
27	.22	0	0	.64	1.32	.64	.23	.78	3.2	0	1.96	1.88
28	0	0	.65	.21	.29	.64	0	.05	2.7	13.4	.64	5.96
29	0	0	.78	.73	.02	.14	2.79	---------	2.2	1.26	.48	1.41
30	0	0	.07	.11	0	2.51	2.94	---------	1.0	1.52	1.26	2.99
31	*0	0	---------	2.51	---------	.73	2.90	---------	.6	---------	1.10	---------
Total	49.44	9.98	11.76	43.95	130.99	118.64	41.41	70.89	79.4	78.27	26.11	30.75
Mean												
Mgd	1.59	0.322	0.392	1.42	4.37	3.83	1.34	2.53	2.56	2.61	0.842	1.02
Cfs	2.46	0.498	0.607	2.20	6.76	5.93	2.07	3.91	3.96	4.04	1.30	1.58
Ac-ft	152	31	36	135	402	364	127	218	244	240	80	94

Calendar Year 1964: Max 31.0 Min 0 Mean mgd 1.70 Mean cfs 2.63 Ac-ft 1,910
Fiscal Year 1964-65: Max 41.0 Min 0 Mean mgd 1.89 Mean cfs 2.92 Ac-ft 2,120

Peak discharge (base, 100 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
12-20	0630	4.81	200	309	3-23	about 0500	5.75	441	682
2- 4	0900	4.48	142	220	4-13	2000	6.50	711	1,100

* Discharge measurement or observation of no flow made on this day.

Note.--No gage-height record Feb. 10-24, Mar. 2 to Apr. 4.

4160. Punaula Gulch near Pukoo

Location.--Lat 20°05'50", long 156°48'48", on right bank 1.8 miles northwest of Pukoo and 5.2 miles northeast of Kamalo.

Drainage area.--0.24 sq mi.

Records available.--March 1947 to June 1965. Prior to July 1958, published as Punaula Stream near Pukoo.

Gage.--Water-stage recorder. Altitude of gage is 1,200 ft (from topographic map).

Average discharge.--18 years, 0.811 mgd (1.25 cfs).

Extremes.--Maximum discharge during year, 368 mgd (569 cfs) Feb. 4 (gage height, 7.17 ft), from rating curve extended above 6.5 mgd by test on model of station site; minimum, 0.04 mgd (0.06 cfs) Mar. 20-22.
1947-65: Maximum discharge, that of Feb. 4, 1965; minimum, 0.01 mgd (0.02 cfs) Mar. 13, 1947, Feb. 19, 1954.

Remarks.--Records good. No diversion above station.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.4	0.01	1.0	2.60
.5	.05	1.2	5.80
.6	.16	1.5	12.1
.7	.40	2.0	27.6
.8	.81	2.5	48.6
.9	1.50		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.23	0.38	0.06	0.11	9.89	0.17	0.21	0.13	0.07	0.08	3.73	6.52
2	1.42	.26	.06	.07	2.16	1.48	.49	.50	.39	.07	2.34	.71
3	.57	*.14	.05	.19	1.62	.26	.49	3.44	.94	*.07	1.26	.28
4	.40	.13	.17	.98	.98	*.16	.23	33.5	.19	.07	1.36	.31
5	.26	.21	.08	2.86	4.51	.13	.17	1.68	.97	.77	1.97	.45
6	.17	.16	.05	7.57	1.93	.11	.36	.57	.59	2.32	1.87	.16
7	.11	.11	.04	4.49	.59	.10	.34	.49	.13	.71	.98	.11
8	.47	2.71	.04	.46	2.70	.19	.94	.46	.14	.19	4.51	.08
9	.14	.40	.34	.34	1.98	7.46	.19	.43	.71	2.61	.81	.07
10	.09	.21	.09	.38	.81	1.72	.14	.40	.16	1.55	.46	.07
11	2.24	.13	.09	.31	.43	1.41	.13	.65	.08	.34	.21	.07
12	.57	.13	.17	.13	2.07	3.65	.17	.49	.07	.21	.17	.09
13	.21	.73	.09	.10	2.06	1.72	.43	.46	.07	26.2	.13	.09
14	.16	1.82	.07	.34	1.36	.43	*.25	.43	.13	2.06	.14	.10
15	.21	.28	.12	.94	.37	1.78	.50	.43	.07	.31	.16	.08
16	.16	1.50	*1.85	.69	.26	4.20	.26	.57	.06	.19	.16	.09
17	.10	1.49	1.54	.57	.19	1.18	.11	.53	.05	.13	.11	.08
18	.08	.43	.81	1.12	.19	.34	.07	.43	.05	.10	.15	.07
19	.19	.19	.19	1.84	5.64	15.4	.07	.43	.05	.10	.28	.34
20	.72	.14	1.34	1.42	5.64	13.6	.05	.43	.04	.10	*1.12	.40
21	1.26	.11	.31	3.68	1.72	2.03	.56	.43	.04	.16	.31	.23
22	3.96	.17	.41	*.93	.43	1.26	.59	*.31	1.41	.33	.13	1.53
23	5.16	.13	.80	.49	2.67	1.55	.81	.13	14.4	.34	.08	.43
24	6.57	.09	1.12	.86	1.68	.49	.65	3.30	9.05	.13	.07	.13
25	2.58	.07	.19	.49	.31	.57	.32	.94	1.36	.09	.07	.70
26	.28	.07	.21	.92	.90	.37	.49	.34	.26	.07	1.25	.88
27	.16	.07	.11	.34	.31	.34	.31	.19	.13	.07	.63	1.41
28	.11	.07	.29	.23	.17	.31	.11	.11	.09	4.73	.19	.92
29	.16	.07	.21	.79	.14	.26	.42	---------	.08	.46	.14	.31
30	.40	.06	.21	.26	.13	1.42	1.23	---------	.56	.75	1.35	1.02
31	.14	.06	---------	1.88	---------	.34	.58	---------	.14	---------	.42	---------
Total	29.28	12.52	11.11	35.78	53.84	64.43	11.67	52.20	32.48	45.31	26.56	17.73
Mean												
Mgd	0.945	0.404	0.370	1.15	1.79	2.08	0.376	1.86	1.05	1.51	0.857	0.591
Cfs	1.46	0.625	0.572	1.78	2.77	3.22	0.582	2.88	1.62	2.34	1.33	0.914
Ac-ft	90	38	34	110	165	198	36	160	100	139	82	54

Calendar Year 1964: Max 15.4 Min 0.04 Mean mgd 0.888 Mean cfs 1.37 Ac-ft 998
Fiscal Year 1964-65: Max 33.5 Min 0.04 Mean mgd 1.08 Mean cfs 1.67 Ac-ft 1,210

* Discharge measurement made on this day.

Peak discharge (base, 70 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-24	0300	3.85	140	217	3-23	1000	3.46	107	166
12-12	1700	3.48	108	167	4-13	2100	6.87	354	548
12-20	0430	4.68	216	334	5- 1	0700	3.36	99.2	153
2- 4	0930	7.17	368	569	5- 8	1930	4.88	232	359

4195. Papio Gulch at Halawa

Location.--Lat 21°08'55", long 156°44'16", on left bank 200 ft downstream from wooden bridge on Highway 45 and 0.8 mile south of Halawa.

Drainage area.--0.94 sq mi.

Records available.--July 1963 to June 1965.

Gage.--Water-stage recorder. Altitude of gage is 640 ft (from topographic map).

Extremes.--Maximum discharge during year, 1,760 mgd (2,720 cfs) Apr. 13 (gage height, 11.25 ft), from rating curve extended above 6.4 mgd on basis of slope-area measurements at gage heights 4.60, 7.15, and 11.25 ft; no flow for many days.
1963-65: Maximum discharge, that of Apr. 13, 1965; no flow for many days each year.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Diversion above station for domestic use at Puu O Hoku Ranch.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.55	0	1.3	1.90
.6	.02	1.5	3.50
.7	.08	1.7	6.00
.8	.19	2.0	11.8
.9	.35	2.5	27.5
1.0	.60	3.0	51.0
1.1	.94	4.0	130

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0			0	321	0.1	0.1	0.33	0.21	0.37	5.2	1.63
2	0			0	1.88	*.9	.3	.27	.23	.35	2.5	.92
3	0			0	.31	.08	.3	2.39	.21	.33	.9	.41
4	0			0	.08	.06	.4	*84.8	.20	.26	1.0	.39
5	0			0	.08	.1	.4	4.42	.20	.24	1.9	.35
6	0			.47	.49	.1	.3	2.11	.26	.35	1.8	.29
7	0			2.48	.06	.1	.3	1.31	.18	.35	.7	.26
8	0			.01	.08	.1	.6	.98	.15	.29	12	.24
9	0			0	.06	20	.1	.78	.13	.31	.5	.23
10	0			0	.02	1.3	.1	.82	.08	.31	.3	.23
11	0			0	.02	.9	.1	1.06	.06	.33	.1	.21
12	0			0	.07	*16	.2	.90	.07	.23	.1	.21
13	0			0	.11	1.4	.2	.66	.08	*106	.1	.20
14	0			0	.16	.2	.1	.60	.08	17.8	.1	.19
15	0		(*)	0	.08	1.7	.3	.57	.05	2.11	.2	.19
16	0			0	.04	4.0	.2	.60	.05	1.35	.2	.16
17	0			0	.03	.8	*.13	.86	.05	1.10	.1	.16
18	0			0	.02	.2	.13	.44	.05	1.02	*.2	.16
19	0			.19	2.97	38	.12	*.44	.05	.94	.2	.16
20	0			.43	2.11	30	.12	.33	.10	.86	.8	.16
21	0			.06	1.52	1.9	.43	.26	.09	.75	*.4	.16
22	0			.01	.2	.9	.97	.26	1.46	.69	.37	.18
23	.08			0	2.2	1.2	.29	.28	13.8	.72	.35	.18
24	1.75			*0	1.3	.3	.26	.28	1.31	.86	.33	.16
25	.08			0	.1	.4	1.25	.28	.90	.66	.31	.21
26	0			0	.6	.2	.63	.24	.52	.57	.31	.28
27	0			0	.1	.1	.75	.21	.31	.55	.29	.26
28	0			0	.1	.1	.43	.21	.29	.78	.28	.21
29	0			0	.1	.1	4.27	---------	.26	.66	.26	.19
30	*0			0	.1	1.1	.69	---------	*1.75	.52	.35	.19
31	0		---------	1.73	---------	.2	.43	---------	.52	---------	.29	---------
Total	1.91	0	0	5.38	18.20	122.54	14.90	106.69	23.70	141.66	32.44	8.77
Mean												
Mgd	0.062	0	0	0.174	0.607	3.95	0.481	3.81	0.765	4.72	1.05	0.292
Cfs	0.096	0	0	0.269	0.939	6.11	0.744	5.89	1.18	7.30	1.62	0.452
Ac-ft	5.9	0	0	17	56	376	46	327	73	435	100	27

Calendar Year 1964:	Max	38	Min	0	Mean mgd	0.428	Mean cfs	0.662	Ac-ft	481
Fiscal Year 1964-65:	Max	106	Min	0	Mean mgd	1.30	Mean cfs	2.01	Ac-ft	1,460

Peak discharge (base, 130 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
12-12	about 1800	4.60	200	309	4-13	2300	11.25	1,760	2,720
2- 4	0830	7.15	738	1,140					

* Discharge measurement or observation of no flow made on this day.

Note.--No gage-height record Nov. 22 to Dec. 2, Dec. 5 to Jan. 16, May 1-21.

5001. Kepuni Gulch near Kahikinui House

Location.--Lat 20°37'21", long 156°15'16", on right bank 120 ft upstream from bridge on State Highway 31, 400 ft upstream from Kamole Gulch, 1.1 miles (revised) east of Kahikinui House, and 8.5 miles west of Kaupo.

Drainage area.--1.91 sq mi.

Records available.--Fiscal year 1963 (annual maximum), May 1963 to June 1965.

Gage.--Water-stage recorder. Altitude of gage is 750 ft (revised, from topographic map). May 24, 1963, to Feb. 13, 1964, at site 50 ft (revised) downstream at different datum.

Extremes.--Maximum discharge during year, 191 mgd (296 cfs) Dec. 21 (gage height, 5.19 ft), from rating curve defined only by computations of peak flow over dam at gage heights 4.80, 6.38, and 7.95 ft; no flow most of the time.

1962-65: Maximum discharge, 327 mgd (506 cfs) Sept. 17, 1963 (gage height, 6.38 ft), from rating curve defined as explained above; no flow most of the time.

Maximum discharge known, 576 mgd (891 cfs) date unknown, but prior to 1962-63 fiscal year (gage height, 7.95 ft, from floodmarks, present site and datum), result of indirect measurement.

Remarks.--Records fair except those for Aug. 28, which are poor. No diversion above station. Continuous records of rainfall are obtained at station.

Rating table (gage height, in feet, and discharge, in million gallons a day)

1.86	0	2.3	5.70
1.9	.40	2.5	10.8
2.0	1.25	3.0	29.0
2.1	2.35	3.5	53.0
2.2	3.80		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1		0				0					0	
2		0				0					0	
3		0				0					0	
4		0				*0					4.51	
5		0				0					0	
6		0				0		(*)			0	
7		0				0					0	
8		0				0	(*)				*0	
9		0	(*)			0					0	
10		0				0					0	
11		0				0					0	
12		0				0					0	
13		0				0					0	
14		0				0					0	
15		0				0					0	
16	(*)	0				0					0	
17		0				0					0	
18		0				0					0	
19		0		(*)		0					0	
20		0				49.1					0	
21		0				45.6					0	
22		0				29.0					0	
23		0				10.9					0	
24		0				0					0	
25		0				0					0	
26		0				0			(*)		0	
27		0				0					0	
28		10				0					0	
29		0				0		---------			0	
30		0				0		---------			0	
31		0	---------		---------	0		---------		---------	0	---------
Total	0	10	0	0	0	134.6	0	0	0	0	4.51	0
Mean												
Mgd	0	0.3	0	0	0	4.34	0	0	0	0	0.145	0
Cfs	0	0.5	0	0	0	6.71	0	0	0	0	0.224	0
Ac-ft	0	31	0	0	0	413	0	0	0	0	14	0

Calendar Year 1964: Max 49.1 Min 0 Mean mgd 0.405 Mean cfs 0.627 Ac-ft 455
Fiscal Year 1964-65: Max 49.1 Min 0 Mean mgd 0.409 Mean cfs 0.633 Ac-ft 458

Peak discharge (base, 50 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
8-28	-	5.12	184	285	12-21	0330	5.19	191	296

* Observation of no flow made on this day.
Note.--No gage-height record Aug. 8 to Sept. 9.

5008. Kukuiula Gulch near Kipahulu

Location.--Lat 20°39'15", long 156°04'42", on right bank on downstream side of State Highway 31, 1.3 miles west of Kipahulu, and 3.2 miles east of Kaupo.

Drainage area.--0.76 sq mi.

Records available.--May 1963 to June 1965.

Gage.--Water-stage recorder. Altitude of gage is 90 ft (from topographic map).

Extremes.--Maximum discharge during year, 1,010 mgd (1,560 cfs) Jan. 23 (gage height, 5.11 ft), from rating curve extended above 2.6 mgd on basis of slope-area measurement of peak flow; no flow for several days.
1963-65: Maximum discharge, that of Jan. 23, 1965; no flow for several days in 1965.

Remarks.--Records poor. No diversion above station. Continuous records of rainfall are obtained at station.

Rating tables (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used Jan. 23, June 4-30)

July 1 to Jan. 23				Jan. 24 to June 30			
1.8	0.12	2.4	5.70	0.35	0	0.9	2.70
1.9	.33	2.6	11.7	.4	.02	1.0	4.60
2.0	.70	2.8	21.5	.5	.12	1.1	7.20
2.1	1.40	3.0	37.0	.6	.31	1.3	15.4
2.2	2.40	3.3	71.5	.7	.72	1.6	36.0
2.3	3.70			.8	1.45	1.9	70.0

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	*0.64	0.54	0.22	1.00	14.3	0.60	4.11	0.6	0.1	0	5.99	4.8
2	.64	.42	.22	.94	3.49	1.13	13.1	.5	.1	0	15.8	3.4
3	2.08	.28	.18	.82	2.48	.56	6.91	1.9	.8	2.5	4.58	2.6
4	2.78	.26	.26	.56	4.27	.48	8.85	4.6	.4	.5	27.4	11.8
5	.60	3.05	.30	.48	22.0	.45	3.34	1.0	1.6	8.46	24.3	12.0
6	.52	.42	.24	2.47	6.06	.42	*2.77	.7	1.1	11.9	11.5	.72
7	.52	.28	.79	6.18	9.51	.39	2.20	.9	.5	5.92	5.74	.77
8	2.10	3.78	.32	2.10	3.89	.56	3.73	.9	.4	1.8	35.3	.57
9	.42	.56	5.47	1.00	6.08	3.17	1.70	.8	.3	5.00	33.2	.40
10	.33	.30	.88	.82	3.29	.59	2.10	.6	.3	2.8	63.0	.26
11	1.70	.30	.88	.64	3.15	.42	3.54	.5	.3	.8	7.20	.22
12	1.88	.88	3.28	.60	15.3	.39	3.33	.7	.2	2.2	6.10	.48
13	.48	.70	.64	.56	4.10	1.24	17.1	.4	.2	2.7	7.0	.12
14	.52	.45	.48	.60	6.07	4.00	10.1	.4	.2	6.5	4.0	.82
15	1.50	.48	.54	1.68	2.40	4.92	5.18	.3	.1	1.8	6.0	3.89
16	.42	.48	5.95	3.38	2.00	5.24	5.27	.3	.1	1.4	5.0	*2.06
17	.33	1.92	1.14	11.0	1.70	3.24	2.40	.3	0	1.0	4.6	1.01
18	.30	1.33	4.31	1.80	*1.50	.82	2.10	.2	.1	.8	4.2	.87
19	.52	*.42	.82	1.22	1.30	12.0	1.80	.2	0	.7	4.0	3.94
20	.36	.26	2.64	.94	1.14	15.0	1.60	.3	0	5.6	6.0	7.46
21	.28	.22	1.29	1.07	4.97	33.0	1.40	.2	0	3.6	4.6	1.85
22	.26	.22	.70	.82	10.8	16.0	.64	.2	0	2.6	4.0	2.82
23	1.15	.20	2.05	.70	2.60	5.70	*68.1	.2	.5	2.0	3.6	.89
24	7.97	.16	.64	.60	1.40	3.56	21	.1	.1	1.6	3.2	.20
25	2.68	.14	.70	.94	1.22	6.49	*6.0	.1	0	1.3	3.0	.63
26	.45	.12	2.25	1.50	1.22	3.19	3.2	.2	*0	1.0	3.2	1.33
27	.39	.22	.88	.56	1.85	2.52	2.0	.1	0	.8	3.2	4.26
28	.42	6.86	2.90	.52	.94	1.90	1.2	.1	0	.7	2.8	4.83
29	.45	.42	2.72	.60	.76	1.70	1.0	---------	0	*.5	2.8	.70
30	.33	.26	*1.70	.48	.70	5.08	.8	---------	0	7.48	2.7	1.15
31	.30	.20	---------	3.83	---------	1.70	.7	---------	0	---------	2.6	---------
Total	33.32	26.13	45.39	50.41	140.49	136.46	207.27	17.3	7.4	83.96	316.61	76.85
Mean												
Mgd	1.07	0.843	1.51	1.63	4.68	4.40	6.69	0.62	0.24	2.80	10.2	2.56
Cfs	1.66	1.30	2.34	2.52	7.24	6.81	10.4	0.96	0.37	4.33	15.8	3.96
Ac-ft	102	80	139	155	431	419	636	53	23	258	972	236

Calendar Year 1964:	Max	61.0	Min	0.12	Mean mgd	4.12	Mean cfs	6.37	Ac-ft	4630
Fiscal Year 1964-65:	Max	68.1	Min	0	Mean mgd	3.13	Mean cfs	4.84	Ac-ft	3,500

Peak discharge (base, 300 mgd)

Date	Time	Gage height	Discharge		Date	Time	Gage height	Discharge	
			Mgd	Cfs				Mgd	Cfs
1-23	1700	5.11	1,010	1,560	5-9	2400	3.80	880	1,360

* Discharge measurement or observation of no flow made on this day.

Note.--No gage-height record Jan. 24 to Apr. 4, Apr. 8, 10-29, May 13 to June 3.

5010. Palikea Stream below diversion dam, near Kipahulu

Location.--Lat 20°41'05", long 156°04'10", on left bank 50 ft downstream from old diversion dam, 2 miles northwest of Kipahulu, and 2.1 miles upstream from mouth.

Drainage area.--6.29 sq mi.

Records available.--February 1927 to September 1929, December 1931 to September 1935, December 1935 to February 1938, May to October, December 1938, January 1939, August 1939 to June 1965. Published as Oheo Stream at elevation 1,550 ft, near Kipahulu 1927-29 and as Oheo Stream below diversion dam, near Kipahulu 1930-56. See also Note below.

Gage.--Water-stage recorder. Datum of gage is 1,546 ft above mean sea level (by vertical angles). Prior to Sept. 6, 1929, at site 100 ft upstream at different datum.

Average discharge.--30 years (1927-29, 1932-35, 1940-65), 37.3 mgd (57.7 cfs).

Extremes.--Maximum discharge during year, 10,400 mgd (16,100 cfs) Jan. 23 (gage height, 18.3 ft, from floodmarks), from rating curve extended above 2,200 mgd on basis of computations of peak flow over dam at gage heights 12.68 and 17.5 ft; minimum, 0.01 mgd (0.02 cfs) on many days.

1927-29, 1931-65: Maximum discharge, that of Jan. 23, 1965; no flow at times.

Revisions.--Figures of maximum discharge for the fiscal years 1961 and 1962 have been revised to 3,500 mgd (5,420 cfs) Feb. 17, 1961 (gage height, 9.70 ft) and 2,460 mgd (3,810 cfs) Oct. 31, 1961 (gage height, 9.48 ft), superseding those published in Surface Water Records of Hawaii and other Pacific Areas for fiscal years 1961 and 1962, respectively.

Remarks.--Records good except those for periods of no gage-height record, which are fair. No diversion above station.

Note.--Published records for peaks in the fiscal years 1932-38, 1940-53, 1956-60 have been found to be in error; revised records are on file in the district office and will be published in the next water-supply paper.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.05	0.01	0.9	7.95	4.0	260
.1	.02	1.1	12.6	5.0	435
.2	.22	1.5	27.0	6.0	660
.3	.65	2.0	52.5	8.0	1,300
.4	1.32	2.5	88.0		
.6	3.40	3.0	134		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	40	16.2	0.29	12.7	385	0.40	132	0.32	0.01	0.02	137	113
2	*28	12.5	.22	3.68	78.5	14.6	382	.29	.02	.01	852	22.1
3	55.3	.89	.13	2.98	109	.77	111	55.6	44.5	3.23	445	9.68
4	77.0	.22	.59	.55	253	.29	74.5	52.4	11.0	.32	1020	56.6
5	10.7	83.2	3.09	.36	629	.19	8.86	5.53	129	320	156	308
6	7.33	6.50	.40	49.8	140	.13	4.98	.77	79.8	441	35.0	13.8
7	4.59	.71	6.84	131	340	.08	1.66	.55	1.88	262	20.9	4.5
8	38.8	11.9	11.6	36.3	232	7.75	3.39	.50	.36	25.1	174	2.8
9	3.43	23.6	116	7.54	177	61.4	1.17	.32	2.06	207	104	1.6
10	.83	2.25	28.0	3.59	105	1.79	1.03	.22	.22	85.7	243	.9
11	39.5	5.18	23.0	.96	91.5	.36	12.2	.16	.10	9.78	8.60	.6
12	46.2	30.0	57.3	.55	448	.29	11.4	.08	.08	55.7	4.80	9.0
13	6.76	19.6	10.6	.32	79.3	40.3	55.3	.05	.03	39.2	19.1	2.2
14	5.76	13.0	11.5	.66	49.7	129	81.2	.02	.03	44.4	2.3	7.5
15	25.5	13.7	6.98	20.6	7.86	227	5.31	.02	.05	3.12	105	40.6
16	2.99	39.7	172	39.7	2.35	116	4.65	.02	.02	.96	12.5	*26.0
17	.71	52.7	24.5	47.5	1.32	61.0	1.57	.01	.02	.55	4.0	14.9
18	.36	20.9	233	5.17	*1.03	3.32	1.10	.01	.02	.40	1.8	16.2
19	6.25	*3.53	10.9	1.17	.89	125	.83	.01	.01	.29	1.2	52.4
20	.95	.65	48.6	.83	.65	729	.60	.01	.01	39.4	48	74.1
21	.29	.36	13.7	18.3	9.72	903	.85	.01	.01	10.9	15.9	18.3
22	.13	.32	4.49	9.86	26.6	381	.55	.01	.01	7.68	2.2	31.5
23	11.0	.22	3.64	6.14	4.24	39.0	*783	.01	19.5	2.46	1.2	8.56
24	104	.13	1.58	3.78	1.32	5.18	78.3	.01	18.4	.96	.7	1.03
25	14.0	.06	132	22.9	1.10	107	17.0	.01	2.65	.40	.5	1.32
26	1.32	.05	9.82	54.8	2.81	17.0	10.8	.01	.05	.22	17.9	6.54
27	.77	.22	6.08	6.05	3.42	28.7	*1.24	.01	.02	.08	33.6	30.5
28	.83	37.0	59.8	.89	.96	8.74	.83	.01	.02	*.03	9.30	54.7
29	2.18	3.98	42.8	4.08	.55	1.40	.77	---------	.02	.03	54.1	7.64
30	.55	.65	*34.6	.68	.40	144	.55	---------	.02	138	29.4	14.7
31	.29	.40	---------	205	---------	17.4	.40	---------	.02	---------	12.2	---------
Total	536.32	400.32	943.37	698.44	3,182.22	3,171.09	1,789.04	116.97	309.94	1,698.94	3,571.20	951.27
Mean												
Mgd	17.3	12.9	31.4	22.5	106	102	57.7	4.18	10.0	56.6	115	31.7
Cfs	26.8	20.0	48.6	34.8	164	158	89.3	6.47	15.5	87.6	178	49.0
Ac-ft	1,650	1,230	2,900	2,140	9,770	9,730	5,490	359	951	5,210	10,960	2,920

Calendar Year 1964:	Max	903	Min	0.05	Mean mgd	59.4	Mean cfs	91.9	Ac-ft	66,730		
Fiscal Year 1964-65:	Max	1,020	Min	0.01	Mean mgd	47.6	Mean cfs	73.6	Ac-ft	53,310		

Peak discharge (base, 1,600 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
11- 5	1730	9.67	3,320	5,140	4-6	0830	8.90	1,820	2,820
12-20	0230	9.59	2,860	4,430	5-2	1700	13.65	6,570	10,200
1-23	1700	18.3	10,400	16,100					

* Discharge measurement made on this day.

Note.--No gage-height record July 1, 2, May 14, 17-20, 22-25, June 7-14.

5020. Hahalawe Gulch near Kipahulu

Location.--Lat 20°40'54", long 156°02'50", on left bank at old ditch intake, 0.7 mile upstream from mouth, and 1.8 miles northeast of Kipahulu Church.

Drainage area.--0.43 sq mi.

Records available.--February 1927 to March 1935, May 1935 to April 1937, May 1938 to June 1965. Monthly discharge only May, June 1938, published in WSP 1319. Published as Right Branch Kahalawe Stream near Kipahulu 1927-56 and as Right Branch Hahalawe Stream near Kipahulu 1956-62.

Gage.--Water-stage recorder and concrete control. Datum of gage is 885 ft above mean sea level (by vertical angles). Prior to May 1, 1938, at datum 8.0 ft lower.

Average discharge.--35 years (1927-34, 1935-36, 1938-65), 3.52 mgd (5.45 cfs).

Extremes.--Maximum discharge during year, 940 mgd (1,450 cfs) Jan. 23 (gage height, 4.80 ft), from rating curve extended above 26 mgd as explained below; minimum, 0.42 mgd (0.65 cfs) Mar. 20-23.

1927-65: Maximum discharge, 2,300 mgd (3,560 cfs) Apr. 29, 1937 (gage height 15.74 ft, datum then in use), from rating curve extended above 54 mgd on basis of slope-area measurement at gage height 4.80 ft and by test on model of station site; minimum, 0.15 mgd (0.23 cfs) Dec. 18, 1929.

Remarks.--Records good. No diversion above station.

Rating tables (gage height, in feet, and discharge, in million gallons a day)

July 1 to Jan. 22

0.9	0.72	1.4	5.50
1.0	1.15	1.7	12.5
1.1	1.75	1.9	22.7
1.2	2.58	2.2	44.0
1.3	3.80		

Jan. 23 to June 30

0.7	0.33	1.3	4.30
.8	.53	1.5	8.40
.9	.86	1.7	15.6
1.0	1.32	1.9	27.0
1.1	2.02	2.2	54.0
1.2	3.00	2.5	95.0

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	*2.49	2.54	0.94	2.20	28.9	1.10	8.20	0.86	0.44	0.90	12.0	9.01
2	2.49	1.79	.90	2.61	5.63	2.54	17.6	.82	.97	.50	10.3	2.83
3	4.12	1.35	.82	2.22	8.79	1.29	6.82	*6.28	6.78	10.7	4.34	2.67
4	3.38	1.15	1.58	1.75	6.84	1.10	8.29	8.73	2.74	1.05	24.6	4.77
5	2.05	5.30	1.82	1.82	25.2	.94	2.45	1.77	4.35	16.6	16.3	8.67
6	2.24	1.60	1.35	10.1	6.72	.86	*2.73	1.06	2.62	17.6	6.86	2.10
7	2.72	1.29	3.65	13.8	9.81	.82	1.67	1.02	.86	6.77	3.60	1.85
8	4.74	10.1	2.34	5.71	4.10	.94	2.65	1.02	.78	1.83	29.9	1.56
9	1.82	2.12	7.48	2.49	6.88	4.56	1.40	.86	1.38	8.34	28.9	1.38
10	1.53	1.46	2.75	2.20	3.93	1.29	1.35	.82	.67	4.33	23.3	1.26
11	8.58	1.78	2.12	1.90	4.13	1.05	3.51	.78	1.03	1.70	2.46	1.21
12	3.79	4.27	5.46	1.67	17.2	1.05	2.47	.86	.70	1.56	2.10	1.77
13	1.97	3.33	1.90	1.35	5.66	1.85	16.8	.70	.58	5.83	3.53	1.26
14	2.97	2.20	3.38	1.68	10.9	6.35	8.49	.67	.91	7.17	2.61	1.70
15	5.42	3.73	2.47	3.84	2.92	4.73	2.20	.64	1.45	1.44	3.58	2.73
16	1.82	2.68	18.9	8.31	2.20	13.9	2.40	.61	.61	1.11	3.21	1.93
17	1.46	3.39	5.26	19.0	1.90	5.09	1.53	.58	.55	.98	1.77	*1.80
18	1.24	3.33	10.7	2.40	*1.67	1.60	1.29	.55	.53	.90	1.50	3.00
19	2.08	*1.95	2.40	1.67	1.75	8.91	1.15	.58	.48	.82	3.30	4.28
20	3.28	1.46	5.00	2.48	1.75	20.6	1.05	.61	.44	10.7	5.24	4.77
21	1.67	1.19	2.81	9.30	5.49	37.3	1.00	.53	.42	6.16	2.18	3.62
22	1.35	1.15	1.97	3.75	11.9	13.1	.90	.58	.42	2.85	1.63	7.06
23	3.35	1.10	2.91	2.49	2.30	3.68	*83.6	.55	*11.3	1.56	1.38	2.46
24	11.1	1.00	1.97	2.20	1.75	2.20	7.87	.53	2.00	1.21	1.21	1.50
25	5.66	.94	2.49	3.59	1.60	6.62	7.42	.50	.83	1.06	1.50	3.94
26	1.75	.90	7.60	4.37	1.91	2.64	2.27	.53	.64	.90	3.71	2.82
27	1.46	1.70	3.32	1.97	2.56	2.30	*1.50	.53	.58	.82	4.51	5.52
28	1.89	12.7	9.49	1.60	1.40	1.82	1.26	.46	.53	.78	2.10	4.39
29	2.81	1.61	7.41	1.53	1.19	1.46	1.16	---------	.50	*.78	4.32	1.93
30	1.53	1.24	3.16	1.64	1.05	5.88	1.01	---------	.48	11.5	2.31	4.48
31	1.29	1.05	---------	7.92	---------	2.20	.94	---------	.50	---------	1.85	---------
Total	94.05	81.40	124.35	129.56	188.03	159.77	202.98	34.03	47.07	128.45	216.10	98.27
Mean												
Mgd	3.03	2.63	4.14	4.18	6.27	5.15	6.55	1.22	1.52	4.28	6.97	3.28
Cfs	4.69	4.07	6.41	6.47	9.70	7.97	10.1	1.89	2.35	6.62	10.8	5.07
Ac-ft	289	250	382	398	577	490	623	104	144	394	663	302

Calendar Year 1964: Max 40.3 Min 0.82 Mean mgd 4.00 Mean cfs 6.19 Ac-ft 4,500
Fiscal Year 1964-65: Max 83.6 Min 0.42 Mean mgd 4.12 Mean cfs 6.37 Ac-ft 4,620

* Discharge measurement made on this day.

Peak discharge (base, 200 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
8-28	1600	3.05	218	337	1-23	1700	4.80	940	1,450
11- 5	1800	3.25	279	432	3-23	1000	3.34	302	467
12-16	1600	3.03	212	328	4- 5	2100	3.18	254	393
12-20	0130	3.19	260	402	5- 8	1830	3.91	514	795

5060. Makapipi ditch near Nahiku

Location.--Lat 20°48'17", long 156°06'25", on right bank at entrance to tunnel No. 1, 1.8 miles south of Nahiku, and 4.7 miles southeast of Keanae.

Records available.--July 1948 to June 1965.

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 1,300 ft above mean sea level (by stadia survey).

Average discharge.--17 years, 2.88 mgd (4.46 cfs).

Extremes.--1948-65: Maximum daily discharge, 8.22 mgd (12.7 cfs) May 26, 1964; minimum daily, 0.42 mgd (0.65 cfs) Mar. 22, 23, 25, Apr. 13, 14, 1958.

Remarks.--Records good. Ditch diverts water from water-development tunnels into Koolau ditch for power, domestic use, and irrigation in central Maui.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.76	2.46	1.76	3.07	6.43	2.15	1.66	1.88	2.80	2.40	4.22	2.92
2	1.88	2.46	1.66	2.92	6.90	2.04	1.76	1.82	3.98	2.28	4.49	2.59
3	2.04	2.40	1.60	2.85	6.52	1.98	1.88	3.12	4.14	2.10	4.22	2.08
4	2.28	2.40	1.55	2.78	6.24	1.82	1.93	4.14	4.56	2.09	5.78	1.93
5	2.65	4.12	1.50	2.78	6.62	1.71	*1.88	3.90	4.81	4.30	5.69	3.48
6	3.00	3.36	1.46	3.90	7.20	1.66	1.88	3.43	5.33	4.47	5.33	3.00
7	3.14	3.14	1.41	5.15	7.10	1.60	1.76	3.14	5.24	4.72	5.24	2.59
8	3.21	3.28	1.36	4.38	7.00	1.55	1.71	2.85	4.47	4.64	4.90	2.59
9	3.14	3.28	1.46	3.90	6.72	1.60	1.66	2.65	3.98	5.06	4.30	2.65
10	3.07	3.21	1.41	3.66	6.43	1.60	1.55	2.72	3.66	5.42	3.90	2.65
11	3.14	3.14	1.41	3.50	6.14	1.55	1.50	2.92	3.43	4.98	3.66	2.65
12	3.07	3.07	1.46	3.28	6.34	2.90	1.50	2.65	3.14	4.30	3.43	2.59
13	3.07	3.07	1.55	3.07	6.52	3.90	1.46	2.40	2.92	3.90	3.14	2.46
14	3.00	3.14	1.66	2.92	6.34	3.82	1.41	2.46	2.85	3.66	2.92	2.34
15	2.92	3.14	1.71	2.78	5.60	2.92	1.36	2.53	3.66	3.36	3.18	*2.15
16	2.85	3.21	3.58	2.85	4.81	2.92	1.31	2.72	2.72	3.14	2.65	2.04
17	2.78	3.50	3.73	2.92	*4.22	3.58	1.26	3.50	2.53	2.92	2.46	1.93
18	2.72	*3.58	5.51	3.63	3.90	3.00	1.22	2.72	2.34	2.65	2.34	1.88
19	2.65	3.58	4.72	5.78	5.06	2.92	1.17	*2.72	2.21	2.46	2.15	1.93
20	2.59	3.43	4.06	6.14	4.98	2.78	1.12	2.65	2.10	2.34	2.10	1.98
21	2.59	3.28	3.90	6.52	4.14	2.59	1.17	2.34	1.98	2.15	1.93	1.98
22	2.63	3.14	3.74	6.81	3.90	2.46	1.17	2.28	*2.20	2.04	1.88	2.40
23	3.67	2.92	3.50	6.52	3.66	2.28	3.13	2.15	2.92	1.93	1.76	2.46
24	3.52	2.72	3.36	5.87	3.43	2.15	2.65	2.15	3.92	1.82	1.66	2.46
25	3.28	2.59	3.07	5.60	3.21	2.04	2.59	2.72	3.90	1.71	1.60	2.46
26	3.14	2.40	2.85	6.14	3.00	1.93	2.46	2.78	3.14	1.66	1.60	2.46
27	2.92	2.28	2.65	5.60	2.72	1.82	2.34	3.00	2.92	*1.55	1.55	2.46
28	2.78	2.15	3.75	4.90	2.59	1.71	2.15	2.46	2.78	1.50	1.46	2.53
29	2.65	2.04	4.21	4.47	2.40	1.66	2.10	---------	2.65	1.46	1.41	2.46
30	2.59	1.93	3.14	4.38	2.28	1.76	2.04	---------	2.59	2.32	1.41	2.53
31	2.46	1.82	---------	5.51	---------	1.71	1.98	---------	2.53	---------	1.36	---------
Total	87.19	90.24	78.73	134.58	152.40	70.11	54.76	76.80	102.40	89.33	93.72	72.63
Mean												
Mgd	2.81	2.91	2.62	4.34	5.08	2.26	1.77	2.74	3.30	2.98	3.02	2.42
Cfs	4.35	4.50	4.05	6.71	7.86	3.50	2.74	4.24	5.11	4.61	4.67	3.74
Ac-ft	268	277	242	413	468	215	168	236	314	274	288	223

Calendar Year 1964:	Max	8.22	Min	1.12	Mean mgd	3.44	Mean cfs	5.32	Ac-ft	3,860		
Fiscal Year 1964-65:	Max	7.20	Min	1.12	Mean mgd	3.02	Mean cfs	4.67	Ac-ft	3,390		

* Discharge measurement made on this day.

5080. Hanawi Stream near Nahiku

Location.--Lat 20°48'35", long 156°07'00", on left bank 200 ft upstream from Koolau ditch intake and trail, 1.9 miles southwest of Nahiku, and 4.5 miles southeast of Keanae.

Drainage area.--3.49 sq mi.

Records available.--January 1914 to January 1916, November 1921 to June 1965. Monthly discharge only April to June 1915, published in WSP 1319.

Gage.--Water-stage recorder. Datum of gage is 1,318 ft above mean sea level (by vertical angles). Prior to Nov. 1, 1921, at site 50 ft downstream at datum 0.12 ft lower.

Average discharge.--44 years (1914-15, 1922-65), 14.5 mgd (22.4 cfs).

Extremes.--Maximum discharge during year, 2,670 mgd (4,130 cfs) Jan. 23 (gage height, 10.28 ft), from rating curve extended above 270 mgd as explained below; minimum, 1.67 mgd (2.58 cfs) Jan. 19-21.

1914-16, 1921-65: Maximum discharge, about 3,600 mgd (about 5,570 cfs) Jan. 18, 1916 (gage height, 11.6 ft, present site and datum), from rating curve extended above 270 mgd by test on model of station site; minimum, 1.00 mgd (1.55 cfs) Nov. 14, 1962, Feb. 17, 1963.

Remarks.--Records good except those above 500 mgd, which are fair. No diversion above station.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.2	1.48	2.5	56.0
.3	2.10	3.0	85.0
.6	4.50	4.0	176
1.0	9.60	4.5	250
1.5	19.4	5.0	370
2.0	34.0		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	6.51	4.33	2.52	3.52	109	4.05	2.59	2.24	17.2	2.73	28.2	47.6
2	7.97	13.8	2.52	3.44	22.3	4.23	2.88	2.24	109	2.66	308	13.0
3	10.3	4.50	2.45	3.36	308	3.78	2.88	71.3	132	2.52	191	12.0
4	16.8	3.44	2.96	3.20	71.4	3.60	2.88	42.7	21.9	3.66	224	5.61
5	5.91	17.0	2.59	5.36	254	3.44	*2.45	5.79	11.5	97.0	20.6	65.6
6	4.82	5.02	2.38	16.7	99.3	3.28	2.38	3.69	10.7	97.5	8.23	7.72
7	3.87	4.05	2.38	13.3	166	3.12	2.31	5.71	4.82	56.0	5.67	4.41
8	6.90	8.72	2.45	5.44	113	3.04	2.24	2.53	3.96	13.4	46.6	3.44
9	3.87	5.55	4.36	4.23	122	4.44	2.17	2.66	3.44	21.4	7.59	3.12
10	3.36	4.14	5.06	4.23	58.6	3.92	2.10	3.14	3.12	7.83	4.41	2.88
11	6.56	5.08	5.34	3.52	25.8	6.83	2.10	6.11	2.96	5.02	3.52	2.73
12	4.32	9.45	5.14	3.12	71.1	36.8	2.04	4.28	2.80	4.23	3.20	4.93
13	3.44	5.34	4.50	2.88	18.0	28.9	1.98	2.59	2.73	3.69	3.04	3.04
14	3.78	5.67	4.32	3.04	11.7	15.0	1.98	4.39	4.69	4.82	2.88	2.73
15	10.2	5.91	3.36	5.38	9.92	5.34	1.91	23.9	22.1	3.44	13.8	*2.59
16	4.05	7.42	43.4	6.76	9.15	5.29	1.85	15.3	4.26	3.12	3.78	2.66
17	3.36	7.55	21.8	3.60	8.70	10.0	1.79	17.7	3.28	2.96	2.96	2.59
18	3.20	*5.55	56.9	19.1	8.55	4.23	1.73	3.64	2.96	2.80	2.80	5.06
19	5.40	4.71	6.75	29.0	66.3	5.04	1.73	12.5	2.88	2.80	2.73	7.38
20	6.76	3.87	5.55	29.3	11.6	13.2	1.67	7.66	2.80	2.80	2.66	10.2
21	4.14	3.44	4.23	56.4	8.70	80.0	2.20	3.85	2.73	2.66	2.59	4.73
22	4.87	3.44	3.52	19.1	7.70	22.4	4.10	3.36	*10.2	2.59	2.52	17.9
23	25.2	3.78	3.20	21.5	6.88	3.44	2.49	2.80	14.3	2.45	2.45	5.62
24	12.8	3.20	2.96	11.2	6.27	2.80	41.5	3.77	121	2.45	2.45	3.60
25	4.92	2.96	2.96	25.2	5.79	3.56	32.6	11.8	24.7	2.38	2.52	3.28
26	3.69	2.88	2.80	55.1	5.34	2.80	9.74	11.0	5.55	2.31	2.59	3.20
27	3.36	3.28	3.04	12.2	5.13	2.66	3.12	9.32	3.87	*2.24	2.80	4.42
28	4.14	3.36	33.3	6.88	4.82	2.52	2.59	3.36	3.44	3.13	2.59	4.41
29	4.50	2.88	*17.3	5.24	4.50	2.45	*2.66	---------	3.28	2.86	3.27	3.20
30	3.69	2.66	4.92	4.92	4.32	4.80	2.52	---------	3.28	28.9	3.22	7.02
31	3.20	2.59	---------	8.56	---------	2.96	2.59	---------	2.96	---------	3.19	---------
Total	195.89	165.57	264.96	394.78	1,623.87	297.92	396.28	289.33	564.41	392.35	915.86	266.67
Mean												
Mgd	6.32	5.34	8.83	12.7	54.1	9.61	12.8	10.3	18.2	13.1	29.5	8.89
Cfs	9.78	8.26	13.7	19.6	83.7	14.9	19.8	15.9	28.2	20.3	45.6	13.8
Ac-ft	601	508	813	1,210	4,980	914	1,220	888	1,730	1,200	2,810	818

Calendar Year 1964:	Max	308	Min	2.31	Mean mgd	18.2	Mean cfs	28.2	Ac-ft	20,410
Fiscal Year 1964-65:	Max	308	Min	1.67	Mean mgd	15.8	Mean cfs	24.4	Ac-ft	17,690

* Discharge measurement made on this day.

Peak discharge (base, 850 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
11- 3	1000	6.72	1,200	1,860	2-3	1700	5.90	930	1,440
11- 5	2000	6.00	990	1,530	5-2	1530	7.10	1,310	2,030
1-23	1630	10.28	2,670	4,130	5-8	1500	6.44	1,110	1,720

5120. Koolau ditch at Nahiku weir, near Nahiku

Location.--Lat 20°48'55", long 156°07'15", on right bank between Kapaula and Waiohue Gulches, 1.8 miles southwest of Nahiku, and 3.8 miles southeast of Keanae.

Records available.--February 1919 to June 1965.

Gage.--Water-stage recorder and sharp-crested weir. Datum of gage is 1,289.14 ft above mean sea level, datum of 1929.. Prior to Apr. 28, 1922, staff gage at same site and datum.

Average discharge.--46 years, 22.0 mgd (34.0 cfs).

Extremes.--1919-65: Maximum daily discharge, 64.4 mgd (99.6 cfs) May 11, 1963; no flow at times.

Remarks.--Records excellent. Ditch diverts water from nearly all streams from the Makapipi west to the Alo for power, domestic use, and irrigation in central Maui.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	24.3	18.0	10.8	19.1	59.5	18.0	12.1	10.2	25.3	12.7	58.0	48.9
2	25.5	31.5	10.5	18.0	54.5	18.7	14.4	10.5	61.5	12.1	59.5	36.0
3	32.0	18.3	10.2	17.2	61.0	16.5	14.1	46.6	44.6	11.2	61.0	33.6
4	42.0	15.4	11.8	16.5	61.0	15.4	13.7	29.5	54.5	14.9	56.0	23.9
5	25.5	43.8	10.5	24.1	62.0	14.7	12.1	21.6	50.5	59.5	44.0	48.8
6	*22.0	22.8	9.91	46.5	60.5	14.1	11.5	20.2	46.0	60.0	33.0	31.1
7	18.3	18.0	9.60	49.0	63.2	13.4	10.8	23.0	28.0	59.5	24.7	21.6
8	26.4	31.6	10.2	28.0	62.0	13.0	10.2	12.4	22.0	46.5	34.6	18.0
9	18.0	22.8	16.7	22.4	62.0	18.7	9.91	4.47	19.1	58.0	27.9	16.1
10	15.8	16.8	17.2	21.3	61.5	18.8	9.60	0	16.8	40.5	18.7	14.7
11	27.7	19.4	19.8	18.3	60.5	24.5	9.32	12.2	15.4	27.5	15.8	14.1
12	20.2	31.8	19.4	16.1	62.0	49.1	9.04	19.1	14.1	22.4	14.7	20.5
13	16.5	22.0	17.6	14.7	*59.5	54.5	8.76	13.4	13.4	19.4	14.1	15.1
14	17.2	22.0	18.0	15.1	49.5	44.5	8.76	19.4	20.6	21.6	13.0	13.7
15	32.0	23.1	15.1	22.4	42.0	26.3	8.20	26.4	44.0	16.8	27.5	*12.4
16	18.3	28.4	47.5	28.8	39.0	25.0	7.92	32.9	19.1	15.1	16.8	12.1
17	15.4	30.5	45.0	18.7	35.5	34.2	7.64	40.6	14.7	14.1	13.4	11.5
18	14.4	*24.3	60.0	27.7	34.5	20.9	7.36	19.1	13.4	13.4	12.1	16.6
19	20.2	20.9	34.5	59.5	62.6	19.9	7.08	*31.5	12.7	13.4	11.5	25.7
20	25.4	16.8	28.8	59.5	50.0	25.3	7.08	28.1	12.4	13.4	11.2	29.3
21	18.0	15.4	23.1	62.0	39.5	47.9	9.52	17.2	11.8	11.8	10.5	20.2
22	20.2	16.5	19.8	55.5	34.5	16.0	15.0	15.4	18.2	11.2	10.2	42.0
23	44.9	16.8	16.8	55.5	31.1	9.99	38.2	13.7	39.2	10.5	9.60	24.3
24	35.3	15.1	15.4	47.5	28.4	13.0	37.3	15.6	59.0	10.2	9.32	17.2
25	22.0	13.7	14.7	54.0	26.3	16.1	24.4	33.0	51.5	9.60	9.91	15.4
26	18.3	13.0	13.7	61.0	24.3	13.0	29.2	37.4	23.9	9.32	10.8	15.1
27	16.5	14.7	14.4	29.8	23.1	12.1	15.8	33.0	19.1	9.04	11.8	18.7
28	18.0	14.4	49.7	35.0	21.6	7.63	13.4	16.8	16.5	11.8	10.8	19.1
29	18.3	13.0	45.2	20.1	20.2	7.44	12.7	---------	15.4	11.5	12.4	15.1
30	16.1	11.8	23.9	29.0	19.4	18.3	11.8	---------	15.4	47.3	12.4	27.0
31	14.4	11.2	---------	42.0	---------	13.4	12.1	---------	13.7	---------	12.4	---------
Total	699.1	633.8	659.81	1034.3	1370.7	660.36	418.99	603.27	831.8	694.26	687.63	677.8
Mean												
Mgd	22.6	20.4	22.0	33.4	45.7	21.3	13.5	21.5	26.8	23.1	22.2	22.6
Cfs	35.0	31.6	34.0	51.7	70.7	33.0	20.9	33.3	41.5	35.7	34.3	35.0
Ac-ft	2150	1940	2020	3170	4210	2030	1290	1850	2550	2130	2110	2080

Calendar Year 1964: Max 63.8 Min 7.44 Mean mgd 28.7 Mean cfs 44.4 Ac-ft 32270
Fiscal Year 1964-65: Max 63.2 Min 0 Mean mgd 24.6 Mean cfs 38.1 Ac-ft 27530

* Discharge measurement made on this day.

5180. West Wailuaiki Stream near Keanae

Location.--Lat 20°49'15", long 156°08'37", on left bank 500 ft upstream from Koolau ditch crossing and trail bridge and 2.8 miles south of Keanae Post Office.

Drainage area.--3.66 sq mi.

Records available.--January 1914 to December 1915, May 1916 to October 1917, November 1921 to June 1965. Monthly discharge only for some periods, published in WSP 1319.

Gage.--Water-stage recorder. Datum of gage is 1,343.6 ft above mean sea level (by vertical angles).

Average discharge.--45 years (1914-15, 1916-17, 1922-65), 23.6 mgd (36.5 cfs).

Extremes.--Maximum discharge during year, 2,120 mgd (3,280 cfs) Nov. 3 (gage height, 9.15 ft), from rating curve extended above 420 mgd as explained below; minimum, 1.38 mgd (2.14 cfs) Jan. 19-21.
1914-17, 1921-65: Maximum discharge, about 4,500 mgd (about 6,960 cfs) Jan. 14, 1923 (gage height, 13.5 ft, from floodmarks), from rating curve extended above 420 mgd by logarithmic plotting; minimum, 0.3 mgd (0.5 cfs) July 26, 1922.

Remarks.--Records good. No diversion above station. Water is diverted by Koolau ditch, 500 ft below station, for domestic supply and irrigation of sugarcane in central Maui.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.2	1.33	2.5	73.0
.4	2.43	3.0	121
.7	4.85	3.5	185
1.1	10.3	4.0	270
1.5	19.2	5.0	510
2.0	39.5	6.0	815

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	8.45	5.52	2.90	6.21	175	4.09	2.63	3.74	25.1	4.66	30.4	73.2
2	13.9	14.8	2.90	5.73	33.5	5.23	2.63	4.30	198	4.18	229	24.3
3	14.7	5.40	2.63	5.29	596	3.90	2.56	244	240	3.82	118	22.0
4	21.8	4.38	3.66	4.66	75.5	4.18	2.63	89.2	33.4	38.5	145	9.26
5	8.41	23.2	2.50	8.59	346	3.82	*2.20	12.5	14.9	191	47.8	76.4
6	6.34	6.02	2.26	31.6	150	3.26	2.08	8.12	12.7	107	15.3	12.0
7	5.18	4.96	2.50	19.5	318	3.10	2.02	20.7	8.41	51.8	9.82	7.40
8	11.3	13.0	2.76	7.83	194	3.03	1.97	8.74	7.12	19.2	33.7	5.84
9	5.07	8.96	7.07	5.95	174	22.3	1.91	5.62	6.47	25.4	11.1	5.07
10	4.47	5.40	9.03	6.73	72.6	7.43	2.12	6.84	5.73	10.8	7.83	4.47
11	10.0	7.82	10.7	4.85	33.5	23.4	2.63	14.0	5.29	7.83	6.47	4.28
12	5.34	12.9	9.83	4.38	77.7	56.2	1.91	8.43	4.85	6.73	5.62	10.7
13	4.28	10.3	6.60	3.90	18.9	33.7	1.80	5.40	4.85	5.84	5.18	5.62
14	5.04	8.26	5.18	4.36	13.2	16.7	2.02	13.9	20.0	9.16	4.76	4.56
15	15.5	10.2	4.00	9.48	10.8	7.12	1.80	33.4	38.0	5.62	44.3	*4.00
16	5.62	9.98	79.9	9.77	9.50	7.87	1.64	28.8	8.99	4.85	8.54	4.09
17	4.38	8.58	40.6	5.07	*8.26	21.9	1.59	31.8	6.21	4.47	5.62	3.66
18	3.90	*9.20	91.7	23.4	8.29	6.60	1.49	8.70	5.18	4.28	4.66	8.81
19	8.72	6.60	9.98	50.4	105	6.21	1.43	21.0	4.56	23.2	4.18	13.1
20	11.7	5.07	7.98	50.6	15.8	5.95	1.38	15.6	4.18	7.88	3.82	17.0
21	5.73	4.38	5.73	94.6	10.7	9.99	3.91	8.41	3.82	4.76	3.58	9.45
22	13.0	4.66	5.07	36.3	8.41	9.97	14.0	8.26	*11.7	4.66	3.26	25.6
23	49.4	4.85	4.66	37.8	7.54	5.29	2.06	6.21	26.8	3.82	3.10	9.02
24	28.1	3.66	4.09	18.5	6.86	4.00	36.2	11.6	179	3.50	2.97	6.47
25	10.3	3.34	4.09	62.2	6.21	4.41	59.0	23.1	43.7	3.26	2.90	5.84
26	5.84	3.10	3.66	116	5.62	3.34	17.9	21.1	10.3	3.18	3.66	5.29
27	5.07	6.86	4.94	25.9	5.18	3.10	6.08	17.4	7.54	*2.90	5.95	7.47
28	5.88	10.3	61.2	12.5	4.66	2.97	4.47	7.83	6.21	17.4	3.82	6.73
29	6.77	4.44	36.5	9.18	4.38	2.63	*5.71	---------	5.62	6.52	4.20	4.85
30	5.29	3.34	9.02	7.83	4.38	5.57	4.85	---------	12.4	40.3	4.51	10.6
31	4.09	3.03	---------	10.5	---------	3.42	6.36	---------	5.95	---------	4.72	---------
Total	313.57	232.51	443.64	699.61	2499.49	300.68	404.92	688.70	966.98	626.52	783.77	407.08
Mean												
Mgd	10.1	7.50	14.8	22.6	83.3	9.70	13.1	24.6	31.2	20.9	25.3	13.6
Cfs	15.6	11.6	22.9	35.0	129	15.0	20.3	38.1	48.3	32.3	39.1	21.0
Ac-ft	962	714	1360	2150	7670	923	1240	2110	2970	1920	2410	1250

Calendar Year 1964: Max 596 Min 2.26 Mean mgd 25.1 Mean cfs 38.8 Ac-ft 28190
Fiscal Year 1964-65: Max 596 Min 1.38 Mean mgd 22.9 Mean cfs 35.4 Ac-ft 25680

* Discharge measurement made on this day.

Peak discharge (base, 1,200 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
11- 3	1030	9.15	2,120	3,280	3-2	2330	7.11	1,230	1,900
1-23	1600	8.75	1,910	2,960	5-2	1700	8.55	1,800	2,790
2- 3	1830	8.50	1,780	2,750					

5220. Taro patch feeder ditch at Keanae

Location.--lat 20°51'40", long 156°09'00", on left bank at Keanae, 80 ft downstream from intake on Palauhulu Stream, 500 ft downstream from highway bridge, 4.2 miles northwest of Nahiku, and 4.8 miles southeast of Kailua.

Records available.--September 1934 to June 1965.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 51 ft (from topographic map).

Average discharge.--30 years (1935-65), 2.31 mgd (3.57 cfs).

Extremes.--1934-65: Maximum daily discharge, 7.9 mgd (12.2 cfs) June 30, 1941, Feb. 10, 1955; minimum daily, 0.05 mgd (0.08 cfs) Mar. 5, 1939.

Remarks.--Records good. Ditch diverts from Palauhulu Stream for irrigation of taro at Keanae.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.44	2.15	1.86	1.64	2.33	2.15	1.82	2.20	2.69	2.47	1.39	2.71
2	2.39	2.39	1.86	1.64	1.63	2.20	1.82	2.20	4.89	2.41	2.07	2.36
3	2.55	2.10	1.86	1.59	2.80	2.15	1.82	4.03	5.58	2.36	2.94	2.36
4	2.92	2.10	1.82	1.59	1.59	2.10	1.82	1.46	3.15	3.12	2.97	2.15
5	2.44	2.85	1.82	1.64	2.93	2.10	1.82	1.74	2.80	4.98	2.43	2.95
6	2.29	2.34	1.82	2.28	1.77	2.05	1.77	2.69	2.86	3.76	2.69	2.20
7	2.29	2.15	1.82	2.00	2.25	2.05	*1.77	2.75	2.63	3.34	2.52	2.10
8	2.55	2.55	1.77	1.72	1.82	2.00	1.77	2.69	2.58	2.75	2.89	2.04
9	2.29	2.24	1.77	1.64	2.35	2.53	1.77	2.69	2.58	3.03	2.58	1.99
10	2.24	2.15	1.77	1.59	2.15	2.29	1.72	2.63	2.52	2.69	2.41	1.94
11	2.63	2.29	1.77	1.54	1.86	2.46	1.72	2.80	2.52	2.52	2.41	1.89
12	2.39	2.40	1.77	1.50	2.54	3.23	1.72	2.58	2.47	2.47	2.36	1.89
13	2.29	2.15	1.77	1.50	*2.40	2.86	1.72	2.52	2.47	2.41	2.31	1.84
14	2.29	2.10	1.72	1.46	2.97	2.62	1.72	2.75	2.58	2.41	2.26	1.79
15	2.60	2.20	1.72	1.54	2.92	2.24	1.72	2.92	3.48	2.36	2.82	1.74
16	2.24	2.15	2.39	1.54	2.86	2.24	1.72	2.97	2.75	2.31	2.47	1.74
17	2.24	2.20	2.31	1.46	2.86	2.52	1.68	3.16	2.47	2.26	2.31	1.74
18	2.24	2.05	3.16	1.67	2.81	2.15	1.68	2.63	2.41	2.26	2.26	1.79
19	2.24	2.00	2.10	2.00	*3.95	2.10	1.68	*2.74	2.41	2.77	2.26	1.89
20	2.44	*2.00	1.90	1.95	2.86	2.05	1.68	2.75	2.36	2.58	2.20	1.99
21	2.20	2.00	1.77	2.24	2.65	2.05	1.72	2.52	2.36	2.31	2.15	*1.84
22	2.33	1.95	1.72	1.72	2.60	2.00	1.96	2.52	2.41	2.26	2.15	2.31
23	3.01	1.95	1.72	1.82	2.55	1.95	3.07	2.47	3.06	2.20	2.10	1.89
24	2.44	1.95	1.72	1.54	2.49	1.95	1.44	2.56	*4.82	2.15	2.04	1.79
25	2.24	1.95	1.72	1.77	2.44	1.95	2.29	2.98	3.15	2.10	1.99	1.70
26	2.20	1.90	1.72	1.90	2.39	1.90	2.76	2.80	2.69	2.04	1.99	1.70
27	2.20	1.95	1.68	1.54	2.34	1.86	2.44	2.80	2.52	1.99	1.99	1.70
28	2.20	1.90	2.29	1.42	2.29	1.82	2.34	2.52	2.52	2.46	1.94	1.70
29	2.15	1.90	2.24	1.38	2.24	1.82	2.44	---------	2.47	2.15	1.94	1.79
30	2.15	1.90	1.77	1.38	2.20	1.86	2.34	---------	2.63	*2.34	1.89	2.31
31	2.10	1.86	---------	1.38	---------	1.82	2.34	---------	2.52	---------	1.89	---------
Total	73.22	65.77	57.13	51.58	73.84	67.07	60.08	74.07	89.35	77.26	70.62	59.83
Mean												
Mgd	2.36	2.12	1.90	1.66	2.46	2.16	1.94	2.65	2.88	2.58	2.28	1.99
Cfs	3.65	3.28	2.94	2.57	3.81	3.34	3.00	4.10	4.46	3.99	3.53	3.08
Ac-ft	225	202	175	158	227	206	184	227	274	237	217	184

Calendar Year 1964:	Max	5.19	Min	1.38	Mean mgd	2.28	Mean cfs	3.53	Ac-ft	2.560
Fiscal Year 1964-65:	Max	5.58	Min	1.38	Mean mgd	2.25	Mean cfs	3.48	Ac-ft	2.520

* Discharge measurement made on this day.

5230. Koolau ditch near Keanae

Location.--Lat 20°49'53", long 156°10'30", on right bank on west side of Keanae Valley, 2.6 miles southwest of Keanae Post Office, and 5.1 miles southeast of Kailua.

Records available.--January 1910 to December 1912, November 1917 to February 1918, April 1918 to June 1965.

Gage.--Water-stage recorder. Datum of gage is 1,237.7 ft above mean sea level (by plane-table traverse). Jan. 1, 1910, to Dec. 31, 1912, staff gage at same site and datum.

Average discharge.--49 years (1910-12, 1918-65), 66.4 mgd (103 cfs).

Extremes.--1910-12, 1917-65: Maximum daily discharge, 172 mgd (266 cfs) Apr. 19, 1935; no flow at times.

Remarks.--Records good. Ditch diverts at altitude 1,260 ft from nearly all streams from the Makapipi west to the Alo for power, domestic use, and irrigation in central Maui.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	77.3	60.5	31.5	54.4	140	44.7	32.8	33.6	68.7	41.4	141	123
2	94.9	120	31.1	52.4	142	53.4	36.0	36.1	137	37.7	134	110
3	117	54.4	29.9	51.2	138	43.4	36.0	117	118	35.2	136	120
4	127	44.7	40.2	46.7	136	43.0	34.8	134	122	56.2	138	77.8
5	77.3	121	30.3	78.1	138	40.6	29.9	94.9	133	138	142	128
6	*60.5	68.8	27.3	137	138	36.9	29.2	67.7	122	139	125	101
7	49.6	52.8	29.2	130	130	36.0	*26.9	74.2	77.3	139	84.8	60.5
8	89.8	110	32.4	78.1	132	35.2	25.9	62.9	62.1	136	101	49.2
9	50.0	80.4	71.3	58.5	134	86.2	25.2	20.3	54.8	142	96.1	43.4
10	44.7	52.4	69.8	64.5	145	64.3	24.9	37.5	49.2	116	64.1	39.3
11	89.3	73.6	87.9	49.6	144	74.1	26.2	72.6	45.9	75.4	51.2	38.1
12	56.4	115	78.2	44.7	143	138	24.2	66.2	42.6	60.9	46.3	78.1
13	45.5	78.1	60.5	41.0	139	139	22.9	43.4	42.2	53.2	43.4	45.1
14	50.4	75.1	59.5	46.3	130	121	24.2	64.5	77.8	71.3	41.0	38.5
15	101	88.8	44.7	90.2	108	70.0	22.3	82.2	142	49.6	83.5	35.6
16	53.2	104	111	97.4	96.3	70.1	21.4	99.5	66.9	44.2	65.1	36.5
17	43.4	94.7	132	51.6	87.3	111	20.8	116	48.4	41.0	45.1	34.0
18	41.0	84.9	146	66.3	84.8	57.3	19.9	65.3	43.4	39.7	40.2	54.3
19	74.9	61.7	96.3	143	*130	52.8	19.4	*95.8	39.7	78.6	36.9	98.2
20	93.1	*50.4	83.8	146	133	60.5	19.4	104	37.3	62.7	35.2	104
21	54.4	45.5	60.5	*146	104	97.6	34.6	62.9	35.6	39.7	33.2	*60.6
22	56.1	47.5	51.2	140	85.5	81.0	80.8	58.5	53.5	36.5	31.1	135
23	134	49.2	45.9	142	75.8	41.8	103	48.4	125	34.0	29.5	77.0
24	126	41.4	41.8	135	68.4	38.5	102	59.2	*138	32.4	28.8	50.4
25	80.8	37.7	41.8	141	63.3	49.5	75.0	113	141	30.7	28.8	45.5
26	54.4	36.0	39.3	140	58.5	37.3	97.2	112	85.5	29.5	33.2	43.4
27	48.4	49.8	48.8	127	57.3	34.0	50.0	107	61.7	28.4	44.2	65.3
28	56.9	57.5	130	114	52.0	29.4	39.7	58.1	52.4	81.7	33.6	64.5
29	64.5	39.7	137	76.3	48.8	27.0	43.2	---------	48.8	51.6	38.0	44.7
30	51.6	34.8	74.3	76.8	47.1	63.7	40.2	---------	71.1	*134	38.9	93.0
31	42.6	32.8	----------	115	----------	40.2	46.3	---------	48.4	----------	42.8	----------
Total	2,206.0	2,063.2	1,963.5	2,880.1	3,229.1	1,917.5	1,234.3	2,106.8	2,391.3	2,055.6	2,032.0	2,094.0
Mean												
Mgd	71.2	66.6	65.4	92.9	108	61.9	39.8	75.2	77.1	68.5	65.5	69.8
Cfs	110	103	101	144	167	95.8	61.6	116	119	106	101	108
Ac-ft	6,770	6,330	6,030	8,840	9,910	5,880	3,790	6,470	7,340	6,310	6,240	6,430

Calendar Year 1964:	Max	146	Min	4.49	Mean mgd	79.4	Mean cfs	123	Ac-ft	89,220
Fiscal Year 1964-65:	Max	146	Min	19.4	Mean mgd	71.7	Mean cfs	111	Ac-ft	80,340

* Discharge measurement made on this day.

5240. Honomanu Stream at Haiku-uka boundary, near Kailiili

Location.--Lat 20°49'19", long 156°12'15", on left bank at Haiku-uka trail crossing, 4.5 miles southwest of Keanae, 4.8 miles southeast of Kailiili, and 5 miles south of Kailua.

Drainage area.--2.54 sq mi.

Records available.--October 1919 to February 1927, July 1932 to December 1934, June 1962 to June 1965.

Gage.--Water-stage recorder. Altitude of gage is 2,900 ft (from topographic map).

Average discharge.--10 years (1920-26, 1932-34, 1962-65), 8.58 mgd (13.3 cfs).

Extremes.--Maximum discharge during year, 839 mgd (1,300 cfs) Nov. 3 (gage height, 7.68 ft), from rating curve extended above 75 mgd; minimum, 0.16 mgd (0.25 cfs) Jan. 21.
1919-27, 1932-34, 1962-65: Maximum discharge, 1,290 mgd (2,000 cfs) Jan. 14, 1923 (gage height, 9.93 ft), from rating curve extended above 75 mgd; minimum, 0.06 mgd (0.09 cfs) Nov. 20, 1962.

Remarks.--Records good except those above 200 mgd, which are fair, and those for period of no gage-height record, which are poor. No diversion above station.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.6	0.17	1.4	8.30
.7	.36	1.7	17.3
.8	.68	2.0	32.0
.9	1.18	2.5	65.0
1.0	1.88	3.0	109
1.1	2.90	4.0	225
1.2	4.25	5.0	368

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.36	0.90	0.44	1.24	78.1	0.57	0.60	1.30	3.49	0.68	4.63	42.1
2	5.98	2.26	.47	1.18	12.2	.80	.50	1.18	85.6	.60	126	*8.76
3	4.25	1.06	.38	1.49	239	.64	.45	130	107	.57	33.2	9.27
4	5.70	.80	.44	2.15	33.4	.53	.43	25.0	9.25	29.4	29.5	2.16
5	1.88	2.67	.38	3.12	182	.50	.40	4.59	2.36	172	10.2	26.7
6	1.36	1.18	.36	19.3	72.8	.47	.38	1.56	2.90	57.6	2.67	1.97
7	*.95	.85	.44	*7.16	182	.45	.36	3.06	1.30	22.1	1.36	1.18
8	2.37	6.67	.47	2.26	154	.42	.50	1.56	1.06	4.25	13.1	.85
9	1.06	3.50	3.22	1.49	95.6	6.0	.40	1.00	.95	7.80	10.3	.80
10	.85	1.30	4.32	1.64	33.8	1.5	.35	.85	.90	5.94	2.16	.68
11	3.37	1.30	3.14	1.42	12.5	5.0	.33	1.36	.80	2.22	1.06	.68
12	1.64	2.80	3.28	1.00	35.6	7.0	*.31	1.00	.72	1.18	.85	3.02
13	1.06	3.26	1.56	.90	6.83	3.5	.27	.76	.68	.95	.72	1.18
14	1.18	1.64	3.77	1.12	3.26	2.0	.95	1.33	2.68	1.12	.72	.80
15	5.75	2.40	1.72	3.70	1.80	1.5	.60	1.36	17.7	.85	3.07	.64
16	1.30	2.56	37.4	3.02	1.49	10	.41	5.27	2.06	.72	1.24	.60
17	.90	1.97	18.6	1.64	1.30	9.0	.29	8.92	1.12	.64	.80	.60
18	.76	3.14	35.4	1.78	1.42	2.0	.23	1.56	.90	.64	.60	3.03
19	2.88	1.30	2.06	9.38	49.0	1.4	.20	7.62	.76	1.88	.53	4.21
20	4.28	.90	1.64	11.0	5.78	1.1	.18	4.84	.68	1.30	.47	7.28
21	1.36	.76	1.82	26.0	2.06	1.0	1.04	1.88	.60	.72	.44	2.46
22	5.38	.80	1.64	8.87	*1.31	.90	4.87	1.88	1.68	*.53	.41	8.90
23	27.8	.80	1.00	8.38	1.18	.80	33.8	1.30	10.3	.47	.38	2.36
24	15.8	.68	.85	4.72	1.00	.75	4.98	5.05	75.3	.38	.34	3.43
25	2.50	.60	.85	23.0	.90	.70	10.0	11.1	14.6	.38	.44	1.72
26	1.24	*.53	.85	57.4	.85	.65	3.54	5.90	1.72	.36	1.56	1.36
27	1.06	.76	1.06	7.35	.80	.60	1.00	5.12	1.18	.29	2.29	1.97
28	1.30	.85	25.2	2.78	.76	.55	.72	1.42	.95	6.11	1.00	1.64
29	2.11	.60	17.2	1.56	.68	.50	15.0	---------	.85	1.64	1.34	1.12
30	1.24	.50	1.88	1.30	.60	.95	3.39	---------	.85	7.51	1.30	2.46
31	.85	.47	---------	1.64	---------	.65	4.92	---------	.80	---------	1.91	---------
Total	110.52	49.81	171.84	218.99	1,212.02	62.43	91.40	237.77	351.74	330.83	254.59	143.93
Mean												
Mgd	3.57	1.61	5.73	7.06	40.4	2.01	2.95	8.49	11.3	11.0	8.21	4.80
Cfs	5.52	2.49	8.87	10.9	62.5	3.11	4.56	13.1	17.5	17.0	12.7	7.43
Ac-ft	339	153	527	672	3,720	192	280	730	1,080	1,020	781	442

Calendar Year 1964: Max 239 Min 0.36 Mean mgd 9.42 Mean cfs 14.6 Ac-ft 10,590
Fiscal Year 1964-65: Max 239 Min 0.18 Mean mgd 8.87 Mean cfs 13.7 Ac-ft 9,940

* Discharge measurement made on this day.
Note.--No gage-height record Dec. 7 to Jan. 12.

Peak discharge (base, 450 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
11- 3	1100	7.68	839	1,300	3-2	2330	5.72	483	747
11- 5	1900	5.62	466	721	4-5	0430	6.58	634	981
11- 7	2100	5.57	458	709	5-2	1500	7.11	731	1,130
2- 3	1830	7.15	738	1,140					

5310. Kula diversion from Haipuaena Stream near Olinda

Location.--Lat 20°48'24", long 156°13'27", on left bank 3.4 miles east of Olinda and 6.2 miles south of Kailua.

Records available.--July 1945 to June 1965.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 4,320 ft (from topographic map).

Average discharge.--19 years (1946-65), 0.439 mgd (0.679 cfs).

Extremes.--1945-65: Maximum daily discharge, 2.05 mgd (3.17 cfs) Mar. 20, 1948; no flow Nov. 4, 1964.

Remarks.--Records good. Water is diverted from Haipuaena Stream at station for domestic use and irrigation of truck crops in the Olinda and Kula areas.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.62	0.10	0.03	0.36	0.83	0.07	0.07	0.60	0.41	0.11	0.80	1.43
2	.83	.21	.03	.26	.45	.07	.06	.58	1.58	.09	.54	.94
3	1.08	.18	.02	.34	.23	.06	.05	1.26	.54	.08	.06	.84
4	1.09	.10	.02	.50	0	.05	.06	.23	.40	.67	.05	.66
5	.45	.20	.16	*.63	.03	.04	.07	.21	.91	.42	.87	.95
6	.27	.19	.09	1.36	.37	.04	.05	.20	1.09	.21	.81	.62
7	.19	.12	.07	1.22	.70	.03	.05	.20	.50	.20	.62	.34
8	.78	.90	.07	.71	.41	.03	.06	.24	*.34	.19	.84	.23
9	.33	.97	.62	.43	.30	.66	.07	.23	.26	.97	.94	.18
10	.20	.42	.82	.36	1.10	.62	.07	.19	.21	1.48	.68	.13
11	.68	.19	.76	.33	1.28	.79	.07	.20	.18	.87	.34	.11
12	.89	.26	.75	.21	1.58	1.17	.07	.23	.15	.41	.24	.62
13	.60	.57	.41	.16	.93	.62	.06	.15	.12	.30	.18	.34
14	.36	.45	.64	.19	.54	.40	*.66	.12	.40	.31	.14	.19
15	1.23	.52	.61	.75	.38	.30	.36	.14	1.42	.23	.54	.12
16	.52	.69	1.07	.80	.30	.62	.23	.54	.66	.16	.46	.10
17	.31	.64	1.38	.57	.23	.83	.14	1.12	.30	.13	.20	.09
18	.23	.80	1.47	.27	.23	.50	.09	.50	.20	.11	.13	.24
19	.82	.40	.64	.76	1.56	.38	.07	1.13	.15	.11	.10	.93
20	.94	.19	.40	1.25	*.92	.34	.05	1.11	.13	.11	.08	.75
21	.38	.13	.57	1.33	.52	.26	.18	.54	.10	.07	.12	*.56
22	.45	.11	.53	1.13	.33	.20	1.06	.64	.13	.06	.08	1.18
23	1.50	.10	.27	1.21	.26	.15	1.16	.40	1.15	.04	.06	.90
24	.66	.09	.16	.94	.21	.12	.71	.75	1.12	.04	.04	.66
25	.24	.07	.12	1.43	.18	.10	.78	1.13	1.05	.03	.27	.73
26	.23	.05	.10	1.25	.15	.09	1.00	1.18	.62	*.03	.69	.75
27	.23	.05	.10	.97	.13	.08	.40	1.28	.33	.02	.62	.66
28	.23	.09	1.24	.56	.11	.07	.31	.48	.23	.71	.33	.66
29	.23	.07	1.08	.34	.09	.07	1.04	---------	.19	.47	.43	.43
30	.19	.05	.68	.27	.08	.07	1.05	---------	.16	.93	.53	.48
31	.13	.04	---------	.27	---------	.09	1.02	---------	.14	---------	.31	---------
Total	16.89	8.95	14.91	21.16	14.43	8.92	11.12	15.58	15.17	9.56	12.10	16.82
Mean												
Mgd	0.545	0.289	0.497	0.683	0.481	0.288	0.359	0.556	0.489	0.319	0.390	0.561
Cfs	0.843	0.447	0.769	1.06	0.744	0.446	0.555	0.860	0.757	0.494	0.603	0.868
Ac-ft	52	27	46	65	44	27	34	48	47	29	37	52

Calendar Year 1964:	Max	1.77	Min	0	Mean mgd	0.519	Mean cfs	0.803	Ac-ft	582		
Fiscal Year 1964-65:	Max	1.58	Min	0	Mean mgd	0.454	Mean cfs	0.702	Ac-ft	508		

* Discharge measurement made on this day.

5311. Haipuaena Stream at Kula pipeline intake, near Olinda

Location.--Lat 20°48'24", long 156°13'27", on left bank at Kula pipeline intake, 3.4 miles east of Olinda, and 6.2 miles south of Kailua.

Drainage area.--0.27 sq mi.

Records available.--January to April 1946 (fragmentary), May 1946 to June 1965.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 4,320 ft (from topographic map).

Average discharge.--19 years, 0.525 mgd (0.812 cfs).

Extremes.--Maximum discharge during year, 62.0 mgd (95.9 cfs) Nov. 3 (gage height, 3.30 ft), from rating curve extended above 1.3 mgd as explained below; no flow for many days.

1946-65: Maximum discharge, 87 mgd (135 cfs) Jan. 24, 1948 (gage height, 3.72 ft), from rating curve extended above 1.3 mgd by differential-curve method; no flow at times each year.

Remarks.--Records fair. Kula pipeline diverts all water from Haipuaena Stream at low flow.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.85	0	1.5	3.50
.9	.03	1.8	7.60
1.0	.18	2.2	15.4
1.1	.52	2.5	25.0
1.3	1.60		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.01	0	0	0	8.31	0	0	0.06	0.01	0	0.05	3.85
2	.19	0	0	0	1.71	0	0	.02	5.13	0	8.38	.82
3	.09	0	0	0	21.2	0	0	10.4	9.02	0	4.20	.52
4	.17	0	0	.03	3.79	0	0	1.94	1.18	1.77	3.75	.08
5	0	0	0	*0	16.8	0	0	1.12	.63	13.0	.77	2.21
6	0	0	0	1.04	6.61	0	0	.45	.17	5.86	.05	.12
7	0	0	0	.78	15.6	0	0	.28	0	2.35	0	0
8	.04	.50	0	.01	10.4	0	0	.09	*0	.61	2.14	0
9	0	.24	.13	0	9.03	1.41	0	0	0	.70	1.13	0
10	0	0	.13	0	2.19	.09	0	0	0	1.12	.14	0
11	.20	0	.01	0	.30	.42	0	0	0	.08	0	0
12	.07	*0	.04	0	2.26	.23	0	0	0	0	0	.09
13	.01	.03	0	0	.08	0	0	0	0	0	0	0
14	0	0	.28	0	0	0	.13	0	.04	0	0	0
15	.50	0	.03	.02	0	0	0	0	1.22	0	.16	0
16	0	.14	4.45	.05	0	3.28	0	.24	.04	0	0	0
17	0	.01	1.71	0	0	2.60	0	.88	0	0	0	0
18	0	.15	2.76	0	0	0	0	0	0	0	0	.18
19	.10	0	0	.33	4.03	0	0	.45	0	0	0	.92
20	.10	0	0	.78	.25	0	0	.32	0	0	0	.31
21	0	0	.02	1.97	0	0	.02	0	0	0	0	*.03
22	.57	0	0	.54	0	0	.41	.01	0	0	0	.50
23	3.37	0	0	.26	0	0	3.86	0	.83	0	0	.11
24	3.36	0	0	.09	0	0	.61	.33	6.60	0	0	.13
25	.71	0	0	2.70	0	0	.57	1.55	1.21	0	.02	.03
26	.21	0	0	6.29	0	0	.23	.37	0	*0	.01	0
27	.07	0	0	.64	0	0	0	.39	0	0	.01	0
28	0	0	3.16	0	0	0	0	0	0	.10	0	0
29	0	0	3.72	0	0	0	2.83	---------	0	0	.01	0
30	0	0	.12	0	0	0	1.19	---------	0	.14	0	0
31	0	0	---------	0	---------	0	1.16	---------	0	---------	0	---------
Total	9.77	1.07	16.56	15.53	102.56	8.03	11.01	18.90	26.08	25.73	20.82	9.90
Mean												
Mgd	0.315	0.035	0.552	0.501	3.42	0.259	0.355	0.675	0.841	0.858	0.672	0.330
Cfs	0.487	0.054	0.854	0.775	5.29	0.401	0.549	1.04	1.30	1.33	1.04	0.511
Ac-ft	30	3.3	51	48	315	25	34	58	80	79	64	30

Calendar Year 1964: Max 21.2 Min 0 Mean mgd 0.788 Mean cfs 1.22 Ac-ft 888
Fiscal Year 1964-65: Max 21.2 Min 0 Mean mgd 0.729 Mean cfs 1.13 Ac-ft 817

Peak discharge (base, 44 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
11-3	1030	3.30	62.0	95.9	4-5	0230	2.97	45.5	70.4
11-7	0500	2.99	46.5	71.9	5-2	1730	3.05	49.5	76.6
2-3	1730	3.08	51.0	78.9					

* Discharge measurement or observation of no flow made on this day.

5360. Haipuaena Stream above Spreckels ditch, near Huelo

Location.--Lat 20°51'04", long 156°11'28", on left bank 200 ft upstream from Spreckels ditch, 2.8 miles west of Keanae, 3.3 miles southeast of Kailua, and 4.7 miles southeast of Huelo.

Drainage area.--1.16 sq mi.

Records available.--October 1913 to June 1965. Monthly discharge only July 1915, published in WSP 1319. Prior to July 1954, published as "Haipuaena Stream near Huelo." Records for December 1910 to September 1913 at site 600 ft downstream not equivalent owing to inflow from Spreckels ditch.

Gage.--Water-stage recorder. Datum of gage is 1,512.22 ft above mean sea level (East Maui Irrigation Co. bench mark).

Average discharge.--51 years (1914-65), 9.75 mgd (15.1 cfs).

Extremes.--Maximum discharge during year, 876 mgd (1,360 cfs) Feb. 3 (gage height, 6.19 ft), from rating curve extended above 150 mgd; minimum, 0.68 mgd (1.05 cfs) Jan. 20, 21.
1913-65: Maximum discharge, 1,750 mgd (2,710 cfs) Aug. 12, 1940 (gage height, 6.91 ft), from rating curve extended above 150 mgd; minimum, slightly less than 0.1 mgd (about 0.2 cfs) on several days during January, February, May, June 1945, October 1953.

Remarks.--Records good. Kula pipeline diverts water above station.

Rating table (gage height, in feet, and discharge, in million gallons a day)

1.5	0.49	2.3	12.5
1.6	1.00	2.6	25.5
1.7	1.75	3.0	53.0
1.8	2.86	3.5	107
1.9	4.00	4.0	185
2.0	5.60		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	5.54	3.32	1.43	3.43	98.4	1.93	1.43	2.97	3.55	2.22	12.1	31.1
2	8.13	9.34	1.43	3.43	16.9	3.14	1.35	2.54	*92.3	2.02	90.2	10.0
3	8.65	3.43	1.35	3.66	160	2.02	1.28	121	98.2	1.84	31.9	12.2
4	12.1	2.65	2.24	3.95	24.6	1.75	1.28	68.8	12.0	52.2	24.3	5.23
5	5.28	15.2	1.51	5.33	174	1.67	1.21	8.42	7.06	128	14.7	29.8
6	3.77	4.16	1.28	26.0	52.4	1.59	1.14	4.80	7.37	47.2	9.60	6.12
7	3.20	3.20	1.43	17.9	105	1.43	1.07	14.2	4.00	23.0	5.28	3.66
8	7.10	14.0	1.75	5.60	62.9	1.43	1.21	5.30	3.54	10.4	16.0	*2.97
9	3.09	6.78	9.31	4.00	57.5	12.6	1.35	3.54	3.20	16.2	8.10	2.54
10	2.65	3.54	6.44	4.59	26.8	4.07	1.07	3.31	2.86	7.82	4.87	2.22
11	8.97	6.20	6.20	3.32	15.5	12.1	1.07	5.36	2.43	4.58	3.54	2.12
12	4.20	10.2	5.68	*2.86	43.2	21.5	1.00	3.09	2.22	3.43	3.20	4.97
13	2.97	5.56	4.32	2.54	9.81	13.2	.94	2.43	2.02	2.97	2.86	2.65
14	3.20	4.32	7.11	3.19	6.93	8.50	1.84	7.03	6.06	3.39	2.54	2.02
15	10.2	5.54	4.20	7.90	5.12	3.89	1.35	4.66	17.9	2.65	8.43	1.84
16	3.32	5.98	42.7	8.23	4.32	20.7	1.00	12.4	4.57	2.43	3.54	1.84
17	2.43	5.32	22.0	3.89	3.89	15.5	.88	13.2	2.65	2.22	2.54	1.67
18	2.22	5.82	54.2	11.0	4.40	3.54	.83	3.77	2.22	2.22	2.12	3.21
19	5.75	3.54	6.17	24.0	56.8	3.32	.78	8.59	2.02	6.99	2.02	8.42
20	8.44	2.86	5.12	21.9	9.17	2.97	*.73	7.28	1.84	5.75	1.84	10.4
21	3.43	2.43	2.65	43.2	5.12	2.43	2.79	3.96	1.67	2.65	1.75	5.28
22	7.77	2.97	3.66	16.5	4.16	2.12	8.28	3.54	3.99	2.22	1.59	11.6
23	21.7	2.54	3.09	19.5	3.77	2.02	51.7	3.09	16.6	2.02	1.59	4.74
24	11.1	*2.02	2.86	8.88	3.43	1.84	7.70	5.21	87.6	1.84	1.51	3.43
25	5.70	1.84	2.65	21.0	3.20	2.02	19.1	13.6	15.4	1.67	1.43	3.54
26	3.32	1.75	2.65	47.2	2.86	1.67	6.54	9.58	4.32	1.59	2.02	2.97
27	3.12	2.02	3.09	11.3	2.54	1.51	2.54	7.71	3.20	1.51	3.60	5.92
28	3.68	2.45	26.7	6.17	2.32	1.43	2.02	3.66	2.65	7.54	2.12	5.03
29	4.58	1.75	18.2	4.80	2.12	1.35	15.9	---------	2.43	3.82	2.19	3.32
30	3.09	1.59	4.32	4.16	2.02	3.16	5.57	---------	7.48	17.2	2.74	7.72
31	2.43	1.51	---------	6.30	---------	1.93	7.33	---------	2.86	---------	2.96	---------
Total	181.13	143.83	255.74	355.73	969.18	158.33	152.28	353.04	426.21	369.59	273.18	198.53
Mean												
Mgd	5.84	4.64	8.52	11.5	32.3	5.11	4.91	12.6	13.7	12.3	8.81	6.62
Cfs	9.04	7.18	13.2	17.8	50.0	7.91	7.60	19.5	21.2	19.0	13.6	10.2
Ac-ft	556	441	785	1,090	2,970	486	467	1,080	1,310	1,130	838	609

Calendar Year 1964: Max 174 Min 1.28 Mean mgd 11.0 Mean cfs 17.0 Ac-ft 12,320
Fiscal Year 1964-65: Max 174 Min 0.73 Mean mgd 10.5 Mean cfs 16.2 Ac-ft 11,760

* Discharge measurement made on this day.

Peak discharge (base, 350 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
9-18	0200	4.86	407	630	3-2	2400	5.21	528	817
11- 3	1100	5.20	525	812	4-5	0400	5.50	630	975
11- 5	1900	5.12	497	769	5-2	1500	6.14	856	1,320
2- 3	1800	6.19	876	1,360					

5380. Spreckels ditch at Haipuaena weir, near Huelo

Location.--Lat 20°51'15", long 156°11'25", on right bank near Spreckels ditch trail between Haipuaena and Puohokamoa Streams, 2.7 miles west of Keanae, and 4.5 miles southeast of Huelo.

Records available.--April 1922 to June 1965. Published as "at Haipuaena, near Huelo" 1930-35.

Gage.--Water-stage recorder and sharp-crested weir. Datum of gage is 1,470.96 ft above mean sea level (East Maui Irrigation Co. bench mark). Apr. 29, 1922, to Feb. 19, 1930, at same site at different datum. Feb. 20, 1930, to Oct. 25, 1935, at site 100 ft upstream at different datum.

Average discharge.--42 years (1922-29, 1930-65), 13.8 mgd (21.4 cfs).

Extremes.--1922-65: Maximum daily discharge, 97 mgd (150 cfs) Feb. 10, 1955, Feb. 18, 1956,; no flow at times.

Remarks.--Records fair. Spreckels ditch diverts from all streams between the Nuaailua and the Kailua above Koolau ditch east of the Puohokamoa, and below Koolau ditch west of the Puohokamoa. About 4 mgd was diverted above station to East Maui Irrigation Co. power-plant at Kolea Gulch prior to June 30, 1961, when the plant was abandoned. Water used for domestic supply and irrigation in central Maui.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	20.0	14.6	4.90	8.30	84.1	*6.70	5.53	8.69	9.32	8.70	42.8	71.2
2	27.5	37.9	4.90	8.65	48.4	9.20	5.12	9.78	59.2	7.70	38.4	35.4
3	34.5	12.6	4.72	13.4	82.6	6.33	4.92	59.2	58.8	6.95	46.0	47.4
4	39.5	9.89	13.0	14.5	48.7	6.13	3.51	36.7	15.3	27.6	47.8	18.2
5	20.2	46.4	5.30	26.0	74.5	6.20	2.65	*21.7	9.40	79.3	38.5	52.2
6	13.9	15.8	4.38	52.0	51.9	5.53	3.06	16.1	10.6	73.0	35.5	21.2
7	10.4	11.3	5.30	45.0	82.2	5.53	3.67	31.1	5.53	63.9	19.3	12.1
8	27.9	41.4	7.80	13.4	76.6	5.32	4.54	19.0	4.73	44.8	38.3	*9.30
9	*11.0	24.9	30.4	8.00	70.5	37.6	5.32	12.1	6.79	64.3	32.9	8.20
10	9.35	12.3	23.8	18.4	37.8	12.8	4.18	11.1	7.36	32.4	17.2	6.95
11	30.6	22.2	26.7	11.7	23.1	38.0	3.67	23.7	3.40	18.5	11.1	6.95
12	14.7	38.7	24.2	*8.02	26.3	67.0	3.35	11.7	6.20	12.8	9.60	19.1
13	10.2	22.1	18.5	7.55	17.5	57.4	3.35	9.00	7.95	11.1	8.70	9.30
14	11.8	17.7	25.0	11.9	26.0	32.6	5.74	21.8	28.9	*13.5	8.20	6.95
15	31.5	21.7	15.8	32.6	18.1	12.4	4.36	23.7	63.6	9.00	26.2	6.20
16	12.0	27.3	58.5	35.9	5.73	27.7	3.83	19.1	15.7	8.20	12.6	6.20
17	9.08	22.0	48.4	14.7	0	37.5	3.35	38.2	10.2	7.20	8.70	5.53
18	8.00	22.2	61.7	22.5	0	10.6	2.78	14.7	8.70	7.70	7.45	13.3
19	23.1	12.6	22.6	61.7	0	11.4	2.92	33.1	7.70	35.8	6.70	29.4
20	30.2	10.2	19.1	52.6	0	9.90	2.78	28.0	7.20	27.4	6.20	40.4
21	12.0	8.81	13.3	77.5	0	5.89	14.0	14.9	6.45	9.60	5.97	16.3
22	16.2	9.89	12.9	43.2	0	4.00	30.2	13.9	15.2	8.20	5.53	49.5
23	48.2	9.89	9.62	44.7	0	4.54	60.0	11.1	44.8	7.20	5.12	17.3
24	31.9	7.55	8.00	35.5	3.60	5.53	28.3	21.5	86.3	6.45	5.12	13.9
25	17.5	6.65	7.32	52.0	9.60	7.95	25.1	43.4	56.7	5.97	5.12	12.4
26	11.0	6.20	9.08	78.6	8.70	5.97	12.7	43.1	16.5	5.74	8.45	10.2
27	10.8	8.00	11.0	35.5	8.20	5.53	9.30	31.5	11.4	5.32	13.1	27.5
28	13.3	9.95	45.0	19.1	7.70	4.73	7.20	12.8	9.90	34.9	7.70	21.3
29	18.1	6.88	32.7	10.9	6.95	5.12	46.9	---------	9.30	16.0	8.97	11.1
30	11.0	5.52	13.4	8.40	6.95	13.9	20.4	---------	27.4	65.2	9.68	33.4
31	8.81	5.30	---------	25.1	---------	7.95	25.6	---------	11.1	---------	12.1	---------
Total	594.24	528.43	587.32	897.32	825.73	476.95	358.33	640.67	641.63	724.43	549.01	638.38
Mean												
Mgd	19.2	17.0	19.6	28.9	27.5	15.4	11.6	22.9	20.7	24.1	17.7	21.3
Cfs	29.7	26.3	30.3	44.7	42.5	23.8	17.9	35.4	32.0	37.3	27.4	33.0
Ac-ft	1820	1620	1800	2750	2530	1460	1100	1970	1970	2220	1680	1960

Calendar Year 1964:	Max	84.1	Min	0	Mean mgd	20.7	Mean cfs	32.0	Ac-ft	23,240		
Fiscal Year 1964-65:	Max	86.3	Min	0	Mean mgd	20.4	Mean cfs	31.6	Ac-ft	22880		

* Discharge measurement made on this day.

5410. Koolau ditch at Haipuaena, near Huelo

Location.--Lat 20°51'17", long 156°11'19", on right bank at Haipuaena Stream, 1,000 ft upstream from intake at Puohokamoa Stream, 3.3 miles southeast of Kailua, and 4.5 miles southeast of Huelo.

Records available.--April 1932 to June 1965.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 1,240 ft (from topographic map). Prior to Mar. 21, 1933, at datum 1.94 ft lower, and Mar. 21, 1933, to Mar. 20, 1935, at datum 0.25 ft lower, than present datum.

Average discharge.--33 years, 77.9 mgd (121 cfs).

Extremes.--1932-65: Maximum daily discharge, 194 mgd (300 cfs) July 1, 17, 1963; no flow at times.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Ditch is extension of Wailoa ditch east of Alo Stream; it receives water from Makapipi ditch at Hanawi Stream and diverts from nearly all streams from there west to the Alo. Water is used for power, domestic supply, and irrigation in central Maui.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	76.8	60	32	55	189	46	31.6	34.0	74.9	41.9	144	145
2	95.1	130	32	55	160	55	34.6	36.6	189	38.2	160	114
3	115	55	30	50	180	42.8	35.2	161	177	35.8	176	124
4	136	46	40	46	169	42.5	35.5	179	144	63.5	173	80.5
5	74.8	130	30	80	190	39.0	31.3	104	151	184	158	141
6	59.4	70	28	130	177	35.8	29.5	70.0	148	172	131	100
7	49.2	55	30	130	193	34.3	27.7	91.2	90.0	175	84.0	61.0
8	91.8	120	32	80	190	34.0	26.8	63.4	73.6	142	107	*48.4
9	*49.2	85	75	60	186	93.6	25.9	38.8	62.2	161	102	42.5
10	43.7	55	70	65	180	63.5	25.6	38.1	54.7	119	65.8	37.8
11	98.3	75	90	50	175	86.7	27.1	72.3	53.5	77.2	51.2	36.1
12	57.0	120	80	46	184	156	24.7	67.2	46.4	62.2	45.2	73.6
13	44.8	80	60	41.3	160	148	23.5	43.1	42.5	*53.5	42.5	42.8
14	50.8	80	60	44.8	133	126	25.3	69.3	82.7	70.2	40.2	37.0
15	108	90	48	91.8	110	69.5	23.2	82.2	157	50.0	87.1	34.0
16	52.6	110	120	107	100	78.2	21.7	113	69.8	43.1	65.0	34.9
17	43.1	95	140	53.5	90	126	21.2	128	50.4	40.2	44.0	32.2
18	40.6	90	160	71.5	85	59.0	*20.4	66.2	43.7	38.6	39.0	51.3
19	75.4	65	100	176	130	52.6	18.6	102	40.6	83.4	35.8	96.4
20	100	50	88	172	140	59.4	18.9	104	37.8	68.2	34.0	107
21	55	46	60	188	110	94.3	33.3	63.8	36.1	39.0	32.2	62.8
22	55	48	55	162	90	85.5	75.3	59.0	54.9	35.5	30.7	140
23	160	50	48	158	80	42.5	134	48.8	137	34.0	29.5	74.8
24	140	42	42	137	70	38.6	109	58.9	190	31.9	28.3	51.6
25	85	38	42	156	65	48.8	92.9	125	162	30.1	28.3	46.0
26	55	36	40	186	60	36.4	111	114	88.7	28.9	32.2	43.4
27	50	50	50	140	60	34.0	52.3	111	64.2	28.0	43.1	64.6
28	60	60	140	115	55	28.9	41.3	59.4	54.1	85.8	33.7	63.8
29	65	40	150	80.0	50	26.2	58.1	---------	50.0	51.3	38.1	44.0
30	50	36	75	81.2	46	61.5	41.6	---------	79.3	148	38.1	91.0
31	44	34	----------	116	----------	39.0	47.6	---------	50.0	----------	42.4	----------
Total	2,280.6	2,141	2,047	3,124.1	3,807	1,983.6	1,324.7	2,303.3	2,755.1	2,231.5	2,161.4	2,121.5
Mean												
Mgd	73.6	69.1	68.2	101	127	64.0	42.7	82.3	88.9	74.4	69.7	70.7
Cfs	114	107	106	156	196	99.0	66.1	127	138	115	108	109
Ac-ft	7,000	6,570	6,280	9,590	11,680	6,090	4,070	7,070	8,460	6,850	6,630	6,510

Calendar Year 1964:	Max	193	Min	0.45	Mean mgd	86.3	Mean cfs	134	Ac-ft	96,900		
Fiscal Year 1964-65:	Max	193	Min	18.6	Mean mgd	77.5	Mean cfs	120	Ac-ft	86,800		

* Discharge measurement made on this day.

Note.--No gage-height record July 21 to Oct. 12, Nov. 15 to Dec. 2.

5415. Manuel Luis ditch at Puohokamoa Gulch, near Huelo

Location.--Lat 20°51'48", long 156°11'00", on right bank at lower portal of tunnel between Haipuaena and Puohokamoa Streams, 2.2 miles west of Keanae, and 4.4 miles southeast of Huelo.

Records available.--December 1917 to November 1924, January 1925 to June 1965.

Gage.--Water-stage recorder and sharp-crested weir. Altitude of gage is 920 ft (from topographic map).

Average discharge.--46 years (1918-24, 1925-65), 5.70 mgd (8.82 cfs).

Extremes.--1917-65: Maximum daily discharge, 92 mgd (142 cfs) Jan. 3, 1927; no flow at times.

Remarks.--Records good. Ditch is extension of Center ditch and picks up water from streams between Kolea and Waikamoi Streams for irrigation in central Maui.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.85	1.00	0.32	1.15	60.7	0.66	0.54	0.95	5.15	1.53	7.54	16.6
2	.83	1.78	.28	.60	15.7	.78	.48	.66	45.3	1.23	33.0	2.10
3	1.07	.72	.28	.60	48.7	.72	.48	47.6	51.5	1.07	34.5	1.86
4	3.21	.54	.28	.66	16.3	.66	.42	46.1	2.55	17.4	34.3	.85
5	.93	15.1	.28	1.49	61.5	.60	.37	6.04	3.05	48.2	12.9	15.5
6	.66	1.45	.23	18.8	27.3	.54	.37	2.77	4.84	26.9	5.78	.85
7	.66	.93	.28	18.2	60.7	.48	.32	12.2	1.70	18.1	3.58	.60
8	3.07	8.15	.32	5.04	44.6	.42	.32	4.35	1.38	3.03	5.54	.48
9	*.78	1.53	4.73	2.68	24.0	10.4	.28	3.89	1.23	11.6	1.99	*.48
10	.72	1.15	.78	1.15	6.28	1.23	.28	2.75	1.07	3.21	1.45	.42
11	6.25	1.38	.60	.93	4.11	6.49	.28	4.29	1.30	1.99	1.15	.37
12	1.23	3.49	.66	.78	33.6	19.1	.28	2.08	.85	1.53	1.00	.48
13	.85	1.07	.66	.72	11.1	5.17	.28	1.53	.78	1.30	.93	.37
14	.85	1.07	1.15	.78	4.39	2.97	.32	6.86	3.31	2.13	.78	.32
15	2.32	1.00	.60	*1.98	2.77	1.53	.28	1.99	8.98	1.15	9.22	.32
16	.78	2.35	27.1	3.35	3.19	9.08	.23	13.0	1.07	.93	1.70	.37
17	.66	2.52	9.78	1.07	2.39	8.37	.23	8.50	.85	.78	1.15	.37
18	.60	1.53	25.1	14.7	3.44	1.30	*.18	1.70	.78	.78	1.00	3.38
19	1.30	1.07	1.61	24.6	69.4	1.15	.81	1.53	.72	7.10	.85	1.16
20	2.52	.85	1.30	19.4	17.4	1.00	.18	1.38	.66	6.92	.78	.72
21	.85	.78	1.00	42.6	6.14	.85	1.36	1.00	.60	1.30	.72	.42
22	2.92	.78	.78	12.4	4.57	.78	8.25	.93	1.30	1.07	.66	1.82
23	11.6	.78	.72	6.12	3.88	.72	32.8	.78	9.92	.85	.60	.60
24	1.45	.60	.60	2.77	3.19	.60	6.13	.78	57.6	.78	.54	.42
25	1.07	.54	.54	5.86	1.30	1.00	12.1	3.51	5.89	.72	.48	.37
26	.85	.48	.60	33.8	1.07	.66	2.56	2.24	2.17	.66	.66	.37
27	.78	.54	.54	4.21	.93	.54	1.07	1.30	1.53	.54	.78	1.40
28	.85	.48	10.8	2.46	.85	.54	.85	.72	1.30	1.49	.54	1.00
29	.78	.42	7.18	1.70	.78	.48	5.06	---------	1.07	1.00	.60	.60
30	.66	.37	2.27	3.02	.72	1.67	1.07	---------	10.8	9.70	.54	1.85
31	.60	.32	---------	4.90	---------	.78	1.15	---------	2.17	---------	.54	---------
Total	52.55	54.77	101.37	238.52	541.00	81.27	79.33	181.43	231.42	174.99	165.80	56.45
Mean												
Mgd	1.70	1.77	3.38	7.69	18.0	2.62	2.56	6.48	7.47	5.83	5.35	1.88
Cfs	2.63	2.74	5.23	11.9	27.9	4.05	3.96	10.0	11.6	9.02	8.28	2.91
Ac-ft	161	168	311	732	1,660	249	243	557	710	537	509	173

Calendar Year 1964:	Max	69.4	Min	0.23	Mean mgd	6.39	Mean cfs	9.89	Ac-ft	7,170		
Fiscal Year 1964-65:	Max	69.4	Min	0.18	Mean mgd	5.37	Mean cfs	8.31	Ac-ft	6,010		

* Discharge measurement made on this day.

5430. Middle Branch Puohokamoa Stream at Haiku-uka boundary, near Kailiili

Location.--Lat 20°49'42", long 156°12'50", on left bank 200 ft downstream from Haiku-uka trail crossing, 4.0 miles east of Kailiili, and 4.5 miles south of Kailua.

Drainage area.--0.48 sq mi.

Records available.--March 1919 to February 1927, July 1932 to June 1934, June 1962 to June 1965.

Gage.--Water-stage recorder and masonry control. Altitude of gage is 2,900 ft (from topographic map). Prior to June 12, 1962, at site 200 ft upstream at different datum.

Extremes.--Maximum discharge during year, 301 mgd (466 cfs) May 2 (gage height, 5.08 ft), from rating curve extended above 9.0 mgd on basis of slope-conveyance study; minimum, 0.04 mgd (0.06 cfs), Jan. 20.
1962-65: Maximum discharge, that of May 2, 1965; minimum, 0.04 mgd (0.06 cfs) Nov. 12, 16-20, 1962, Jan. 20, 1965.

Remarks.--Records good except those above 20 mgd, which are poor. Kula pipeline diverts above station at altitudes 4,300 ft (since 1934) and 3,200 ft (since 1944) for domestic use. Continuous records of rainfall are obtained at station.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.6	0.08	1.2	6.70
.7	.28	1.5	14.5
.8	.78	2.0	32.4
.9	1.70	2.5	56.0
1.0	3.05		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.08	0.35	0.13	0.92	18.3	0.28	0.44	0.59	1.50	0.39	1.65	1.11
2	2.71	1.00	.12	.85	4.48	.39	.39	.54	27.9	.35	28.2	*3.14
3	2.07	.39	.13	.92	36.2	.28	.35	24.7	22.2	.28	7.19	4.10
4	2.90	.28	.15	1.18	8.97	.25	.31	9.07	3.50	10.7	6.07	1.48
5	1.00	1.18	.12	1.48	40.0	.22	.15	2.20	1.70	33.2	3.42	7.58
6	.65	.44	.12	6.71	16.6	.22	.13	1.00	1.48	13.5	1.48	1.48
7	*.44	.31	.13	*4.08	29.1	.22	.13	1.55	.85	7.57	1.00	1.00
8	.92	3.26	.12	1.38	24.2	.19	.15	1.00	.78	2.90	5.46	.85
9	.39	1.70	1.25	1.00	18.3	3.19	.13	.54	.65	4.34	1.94	.78
10	.28	.71	1.77	1.08	10.4	.65	.13	.49	.54	2.07	1.28	.71
11	1.08	.78	1.18	.92	5.30	2.49	.12	.71	.49	1.38	1.00	.71
12	.65	1.48	1.18	.78	10.8	3.49	*.10	.49	.39	1.18	.92	1.94
13	.35	1.59	.65	.59	3.35	1.94	.10	.31	.35	1.00	.85	1.00
14	.44	1.00	1.56	.44	2.33	1.00	.28	.44	1.48	.85	.78	.71
15	2.85	1.28	.78	1.38	1.82	.59	.15	.49	5.42	.59	1.00	.65
16	.65	1.38	10.3	1.18	1.48	4.96	.10	2.69	1.00	.49	.85	.65
17	.39	1.18	6.91	.71	1.28	4.26	.10	2.68	.59	.39	.65	.59
18	.35	1.48	11.3	.59	1.38	.92	.09	.85	.49	.44	.54	1.27
19	1.18	.85	1.48	4.24	13.2	.85	.09	3.29	.49	.64	.35	3.09
20	2.07	.71	1.18	5.10	2.54	.78	.08	2.46	.49	.49	.31	4.12
21	.65	.54	1.18	9.52	1.38	.65	.36	1.18	.49	.31	.35	1.86
22	2.51	.39	1.08	4.52	*1.08	.59	2.18	1.08	.78	*.23	.31	4.31
23	5.44	.28	.71	5.47	1.08	.54	8.99	.78	3.85	.22	.28	1.82
24	2.70	.17	.39	2.60	.78	.49	1.63	2.44	21.3	.19	.28	1.28
25	1.38	.13	.39	6.73	.59	.49	3.98	4.46	5.30	.19	.31	1.38
26	.85	*.13	.35	14.4	.49	.49	1.34	2.75	1.28	.19	.85	1.08
27	.85	.17	.44	3.50	.49	.49	.35	2.33	.85	.19	1.00	1.38
28	.85	.17	8.22	1.82	.39	.44	.22	1.00	.65	1.67	.59	1.18
29	1.28	.13	5.34	1.48	.35	.39	4.81	---------	.59	.54	.65	.92
30	.78	.13	1.28	1.18	.31	.65	1.70	---------	.54	3.06	.92	1.48
31	.54	.13	---------	1.28	---------	.54	1.94	---------	.44	---------	.85	---------
Total	40.28	23.72	59.94	88.03	256.97	32.93	31.02	72.11	108.36	89.54	71.33	63.64
Mean												
Mgd	1.30	0.765	2.00	2.84	8.57	1.06	1.00	2.58	3.50	2.98	2.30	2.12
Cfs	2.01	1.18	3.09	4.39	13.3	1.64	1.55	3.99	5.42	4.61	3.56	3.28
Ac-ft	124	73	184	270	789	101	95	221	333	275	219	195

Calendar Year 1964:	Max	40.0	Min	0.12	Mean mgd	2.81	Mean cfs	4.35	Ac-ft	3150
Fiscal Year 1964-65:	Max	40.0	Min	0.08	Mean mgd	2.57	Mean cfs	3.98	Ac-ft	2880

* Discharge measurement made on this day.

Peak discharge (base, 87 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
11- 3	0900	3.35	113	175	3-2	2400	3.55	130	201
11- 5	1800	3.03	89.1	138	4-5	0430	3.88	160	248
2- 3	1730	4.46	222	343	5-2	1400	5.08	301	466

5450. Puohokamoa Stream above Spreckels ditch, near Huelo

Location.--lat 20°51'21", long 156°11'29", on right bank 150 ft upstream from Spreckels ditch inflow and trail crossing, 3.2 miles southeast of Kailua, and 4.4 miles southeast of Huelo.

Drainage area.--2.35 sq mi.

Records available.--June 1913 to June 1965. Monthly discharge only for some periods, published in WSP 1319. Prior to July 1954, published as "Puohokamoa Stream near Huelo." Records for December 1910 to May 1913 at site 700 ft downstream not equivalent owing to inflow of Spreckels ditch.

Gage.--Water-stage recorder and masonry control. Datum of gage is 1,322.04 ft above mean sea level (East Maui Irrigation Co. bench mark). Prior to May 31, 1934, at site 130 ft downstream at different datum.

Average discharge.--52 years, 21.2 mgd (32.8 cfs).

Extremes.--Maximum discharge during year, 1,440 mgd (2,230 cfs) May 2 (gage height, 6.76 ft), from rating curve extended above 590 mgd; minimum, 1.32 mgd (2.04 cfs) Jan. 18-21.
1913-65: Maximum discharge, 2,360 mgd (3,650 cfs) Apr. 16, 1960 (gage height, 9.31 ft), from rating curve extended above 410 mgd by logarithmic plotting; minimum, 0.4 mgd (0.6 cfs) Oct. 26, 1917.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Kula pipeline diverts above station at altitudes 4,300 ft (since 1934) and 3,200 ft (since 1944) for domestic use.

Rating tables (gage height, in feet, and discharge, in million gallons a day)

July 1 to Sept. 17

0.7	1.86	1.2	17.0
.8	3.44	1.5	36.0
.9	5.62	2.0	86.0
1.0	8.60		

Sept. 18 to June 30

0.6	0.81	1.6	44.0
.7	1.96	2.0	86.0
.8	3.70	2.5	164
.9	6.08	3.0	270
1.1	12.8	3.5	410
1.3	22.6		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	11.1	6.35	2.27	6.34	191	4.12	2.94	a6.0	10.6	5.56	22.0	52.9
2	15.8	21.0	2.27	6.34	35.1	6.64	2.76	a5.0	207	5.05	163	17.8
3	18.1	6.16	2.13	6.61	*253	4.34	2.58	a260	222	4.80	58.0	23.8
4	26.4	4.85	3.60	7.20	48.8	3.70	2.41	a120	30.4	137	42.3	9.77
5	10.5	32.8	2.42	16.1	337	3.31	2.25	a 20	17.4	243	30.1	56.3
6	7.00	8.22	1.99	52.9	106	3.12	2.10	11.0	17.4	104	21.3	12.2
7	5.35	5.62	2.27	37.0	190	3.12	1.96	24.5	11.3	54.3	12.1	6.90
8	14.6	29.7	2.74	12.1	110	2.94	2.10	12.2	9.10	26.6	34.1	5.30
9	5.35	13.6	19.0	8.10	101	24.2	1.96	7.50	8.10	43.4	13.7	*5.05
10	4.42	6.43	12.4	9.84	56.7	7.62	1.82	7.32	7.20	19.4	9.10	4.34
11	a17	12.5	12.9	6.61	38.8	28.3	1.82	14.2	6.61	13.2	6.90	4.34
12	a8.0	23.1	11.4	*5.56	88.7	44.7	1.69	7.80	5.82	9.84	6.34	10.3
13	4.85	11.3	7.92	4.80	24.5	30.9	1.69	5.82	5.56	8.40	5.56	5.56
14	5.10	8.26	12.6	5.82	17.8	19.1	2.41	16.6	20.5	*7.80	5.30	4.34
15	19.2	10.5	7.92	16.9	14.2	7.80	2.10	10.5	45.1	5.56	14.6	3.90
16	6.16	12.9	71.9	18.2	11.7	30.2	1.69	31.3	11.0	4.80	6.61	3.70
17	4.42	10.4	42.0	7.80	9.84	30.0	1.56	27.4	6.90	4.34	5.05	3.31
18	3.79	10.8	114	19.1	12.1	7.50	*1.32	8.75	6.08	4.34	4.34	6.54
19	11.2	6.16	13.7	51.7	115	6.90	1.32	19.7	5.56	12.7	3.70	16.7
20	17.4	5.10	11.7	42.7	20.6	6.08	1.32	16.8	5.05	10.1	3.31	21.2
21	6.16	4.42	8.10	85.0	13.2	4.80	a5.5	9.84	4.56	4.80	3.12	11.5
22	15.0	4.85	7.20	38.0	10.2	4.34	a16	8.10	10.5	4.12	2.94	30.0
23	36.4	4.62	5.82	44.3	9.10	3.90	a100	6.90	38.6	3.50	2.76	9.84
24	15.2	*3.44	4.56	18.9	7.80	3.50	a15	13.1	195	3.31	2.58	6.08
25	8.60	3.06	4.56	43.1	6.61	4.34	a40	30.3	36.4	3.12	2.58	6.08
26	5.89	2.74	4.34	81.9	5.82	3.31	a13	23.7	12.1	2.76	3.70	5.56
27	5.35	3.24	5.56	23.4	5.56	3.12	a6.0	18.3	8.40	2.41	6.61	13.3
28	7.29	3.60	47.5	14.2	5.05	2.94	a4.0	8.40	7.20	12.0	3.90	11.4
29	9.61	2.74	34.1	11.0	4.56	2.76	a34	---------	6.61	6.86	3.90	6.34
30	5.89	2.42	9.10	9.84	4.34	6.94	a11	---------	15.8	37.9	4.34	17.1
31	4.62	2.42	---------	14.5	---------	4.12	a15	---------	6.61	---------	4.34	---------
Total	335.75	283.30	487.97	725.86	1854.08	318.66	299.30	751.03	1000.46	804.97	508.18	391.45
Mean												
Mgd	10.8	9.14	16.3	23.4	61.8	10.3	9.65	26.8	32.3	26.8	16.4	13.0
Cfs	16.7	14.1	25.2	36.2	95.6	15.9	14.9	41.5	50.0	41.5	25.4	20.1
Ac-ft	1030	869	1500	2230	5690	978	919	2300	3070	2470	1560	1200

Calendar Year 1964:	Max	337	Min	1.99	Mean mgd	21.7	Mean cfs	33.6	Ac-ft	24420
Fiscal Year 1964-65:	Max	337	Min	1.32	Mean mgd	21.3	Mean cfs	33.0	Ac-ft	23820

* Discharge measurement made on this day.
a No gage-height record.

Peak discharge (base, 750 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
9-18	0300	4.75	765	1,180	3-2	2200	5.30	930	1,440
11- 5	1900	4.89	807	1,250	4-5	0400	5.37	951	1,470
2- 3	about 1800	6.57	1,370	2,120	5-2	1500	6.76	1,440	2,230

5528. Waikamoi Stream above reservoir at Kula pipeline intake, near Olinda

Location.--Lat 20°48'27", long 156°14'02", on left bank 1,000 ft upstream from Kula pipeline intake and 3.3 miles east of Olinda Prison Camp.

Drainage area.--2.50 sq mi.

Records available.--July 1953 to June 1965. Prior to July 1956, published as Waiakamoi Stream above reservoir at Kula pipeline intake, near Olinda.

Gage.--Water-stage recorder and concrete control. Datum of gage is 4,487 ft above mean sea level (levels by Maui County Waterworks).

Average discharge.--11 years (1954-65), 1.49 mgd (2.31 cfs).

Extremes.--Maximum discharge during year, 1,170 mgd (1,810 cfs) Nov. 3 (gage height, 6.93 ft), from rating curve extended above 6.4 mgd as explained below; minimum, 0.01 mgd (0.02 cfs) Apr. 26-28.
1953-65: Maximum discharge, 1,680 mgd (2,600 cfs) Dec. 10, 1954 (gage height, 8.16 ft), from rating curve extended above 6.4 mgd on basis of computation of peak flow over dam; no flow at times.

Remarks.--Records good except those above 10 mgd, which are fair. Diversion above station for livestock.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.1	0.01	1.0	6.20
.2	.05	1.2	12.5
.3	.14	1.5	25.0
.4	.28	2.0	56.0
.6	.74	2.5	100
.8	1.70	3.0	160

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.18	0.04	0.02	0.13	9.26	0.05	0.02	0.44	0.14	0.03	0.17	4.02
2	.35	.06	.03	.08	2.06	.06	.02	.25	6.66	.04	20.3	1.38
3	.31	.04	.03	.08	140	.06	.02	18.5	14.2	.04	9.73	.64
4	.35	.04	.03	.11	6.45	.05	.02	3.40	1.33	.88	6.46	.33
5	.15	.07	.03	*.15	55.4	.05	.02	1.16	1.16	28.4	1.15	2.56
6	.08	.05	.03	1.05	20.0	.04	.02	.50	.91	9.93	.50	.42
7	.06	.04	.03	1.13	43.6	.04	.02	.25	.30	2.47	.22	.11
8	.20	.38	.03	.30	45.9	.05	.03	.15	*.13	.52	2.89	.05
9	.08	.30	.12	.13	23.8	.51	.03	.08	.07	.93	1.93	.04
10	.05	.11	.20	.09	6.23	.19	.03	.06	.04	2.03	.62	.03
11	.18	.07	.18	.08	1.65	.27	.04	.10	.04	.62	.20	.03
12	.16	*.08	.18	.05	3.23	.63	.04	.09	.03	.22	.06	.19
13	.11	.16	.09	.04	.71	.23	.04	.06	.03	.12	.04	.08
14	.08	.10	.18	.05	.37	.11	.25	.05	.17	.12	.03	.05
15	.67	.12	.14	.18	.20	.08	.10	.07	1.07	.07	.09	.04
16	.16	.20	4.06	.20	.11	3.37	.06	.45	.33	.04	.13	.04
17	.08	.15	2.13	.14	.05	7.44	.04	1.53	.09	.03	.05	.03
18	.06	.27	4.01	.07	.05	.37	.03	.22	.05	.03	.03	.19
19	.22	.14	.34	.28	4.27	.15	.02	.62	.04	.03	.02	.53
20	.29	.06	.26	.67	.77	.11	.02	.76	.03	.04	.03	.42
21	.11	.04	.14	2.20	.31	.07	.13	.26	.03	.03	.03	*.20
22	.46	.04	.12	.87	.14	.05	.48	.23	.04	.03	.02	.72
23	4.28	.04	.07	.62	.08	.04	4.18	.16	.80	.02	.02	.44
24	5.33	.03	.05	.39	.05	.03	1.22	.69	9.35	.02	.02	.15
25	.95	.03	.04	3.53	.04	.03	.60	2.18	1.51	.02	.06	.23
26	.22	.02	.04	7.50	.03	.03	.86	.84	.39	*.01	.13	.33
27	.08	.03	.04	1.26	.03	.03	.14	1.00	.14	.01	.14	.22
28	.06	.03	2.73	.32	.03	.02	.08	.24	.07	.13	.07	.20
29	.07	.03	2.75	.13	.03	.02	4.34	---------	.05	.08	.10	.12
30	.05	.03	.45	.08	.04	.02	2.11	---------	.04	.23	.14	.14
31	.04	.03	----------	.07	----------	.03	2.02	---------	.03	----------	.08	----------
Total	15.47	2.83	18.55	21.98	364.89	14.23	17.03	34.34	39.27	47.17	45.46	13.93
Mean												
Mgd	0.499	0.091	0.618	0.709	12.2	0.459	0.549	1.23	1.27	1.57	1.47	0.464
Cfs	0.772	0.141	0.956	1.10	18.9	0.710	0.849	1.90	1.96	2.43	2.27	0.718
Ac-ft	47	8.7	57	67	1120	44	52	105	121	145	140	43

Calendar Year 1964: Max 140 Min 0.02 Mean mgd 1.76 Mean cfs 2.72 Ac-ft 1,980
Fiscal Year 1964-65: Max 140 Min 0.01 Mean mgd 1.74 Mean cfs 2.69 Ac-ft 1,950

* Discharge measurement made on this day.

Peak discharge (base, 130 mgd)

Date	Time	Gage height	Discharge		Date	Time	Gage height	Discharge	
			Mgd	Cfs				Mgd	Cfs
11-3	1100	6.93	1,170	1,810	11-8	0530	2.96	155	240
11-5	2030	3.82	291	450	4-5	0330	3.07	170	263

5700. Nailiilihaele Stream near Huelo

Location.--Lat 20°52'28", long 156°13'06", on left bank 200 ft upstream from Wailoa ditch intake, 1,000 ft upstream from New Hamakua ditch trail, 1.5 miles south of Kailua, and 2.4 miles southeast of Huelo Church.

Drainage area.--3.58 sq mi.

Records available.--December 1910 to December 1911, October 1913 to June 1918, August to October 1919, December 1919 to June 1924, January 1925 to June 1965. Gage-height records for July to December 1912 at site 700 ft downstream not equivalent owing to diversion. Monthly discharge only for some periods, published in WSP 1319.

Gage.--Water-stage recorder and masonry control. Datum of gage is 1,205 ft above mean sea level (by vertical angles). Dec. 9, 1910, to Dec. 31, 1911, staff gage at site 300 ft downstream at different datum. Oct. 8, 1913, to Mar. 20, 1922, at present site at datum 0.50 ft higher.

Average discharge.--48 years (1914-18, 1920-24, 1925-65), 24.5 mgd (37.9 cfs).

Extremes.--Maximum discharge during year, 2,370 mgd (3,670 cfs) May 2 (gage height, 9.20 ft), from rating curve extended above 390 mgd as explained below; minimum, 2.55 mgd (3.95 cfs) Jan. 19-21.

1910-11, 1913-65: Maximum discharge, 4,140 mgd (6,410 cfs) Nov. 18, 1930 (gage height, 10.74 ft), from rating curve extended above 390 mgd by logarithmic plotting; minimum, 0.45 mgd (0.70 cfs) July 14, 1920.

Remarks.--Records good except those above 800 mgd, which are fair. No diversion above station since 1922. All low flow diverted into Wailoa ditch (see p. 135) 200 ft below station for domestic supply, power, and irrigation.

Rating table (gage height, in feet, and discharge, in million gallons a day)

1.8	1.85	2.7	40.0
1.9	3.35	3.0	70.0
2.0	5.40	3.5	135
2.2	11.4	4.0	215
2.4	20.3	5.0	445

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	12.0	15.9	4.38	8.68	241	5.92	4.99	7.74	9.48	6.96	24.2	46.4
2	17.1	35.9	4.17	8.34	46.5	*8.82	4.58	8.69	147	6.70	174	16.5
3	20.8	9.70	3.96	8.68	174	6.44	4.38	281	209	6.44	92.4	20.3
4	39.0	8.34	5.92	11.2	55.6	5.40	4.17	326	27.1	115	39.7	11.0
5	13.9	66.8	4.38	25.1	322	4.99	3.96	22.6	*20.1	220	23.7	51.9
6	10.4	11.8	3.76	71.9	93.0	4.78	3.76	13.4	25.1	116	35.9	13.0
7	9.02	9.02	4.38	59.5	144	4.58	3.76	20.7	12.6	61.1	15.5	8.68
8	25.9	48.8	5.20	15.1	88.3	4.58	3.56	12.7	10.7	33.6	39.5	6.96
9	8.68	15.9	28.4	11.1	87.8	30.6	3.56	12.6	9.70	68.5	14.5	6.44
10	7.48	10.0	12.8	12.6	64.5	8.66	3.35	15.0	8.68	23.8	10.7	5.66
11	27.6	15.9	16.6	9.70	46.3	33.9	3.35	28.3	7.74	14.7	9.36	5.40
12	10.0	38.9	13.6	8.00	102	68.7	3.35	12.2	7.22	11.8	8.34	9.02
13	7.74	13.4	10.7	7.48	35.0	43.2	3.20	9.36	6.96	10.4	7.48	6.18
14	8.68	11.4	18.0	8.68	23.7	30.1	4.99	41.6	27.3	9.70	6.96	5.40
15	23.4	11.4	10.0	25.8	17.4	10.7	3.56	14.2	47.4	8.34	41.4	4.99
16	8.34	20.2	66.0	33.1	14.7	46.3	3.20	38.5	10.4	7.48	10.0	4.99
17	*6.96	16.6	47.0	10.7	12.6	27.2	3.00	30.9	8.00	6.70	7.48	4.58
18	6.70	14.3	131	45.5	14.7	10.0	2.85	11.1	7.22	6.70	6.44	9.29
19	12.8	9.70	16.5	97.9	153	9.36	2.70	15.5	6.44	14.1	5.92	15.3
20	22.2	8.00	15.4	56.0	25.8	8.34	2.55	14.0	5.92	12.5	5.66	17.8
21	8.68	7.22	10.7	100	14.7	7.22	21.0	9.70	5.66	6.70	5.20	7.74
22	28.8	7.48	9.36	44.2	12.2	6.44	26.0	8.68	23.6	5.92	4.99	25.6
23	29.4	7.48	8.00	49.6	10.7	5.92	115	8.00	55.0	5.40	4.78	8.34
24	12.2	5.92	7.48	22.6	9.70	5.66	17.7	15.2	172	4.99	4.58	*6.18
25	9.70	5.40	7.22	42.5	9.02	6.96	36.5	21.6	36.8	4.78	4.38	5.40
26	8.00	4.99	6.96	83.9	8.00	5.40	12.6	23.9	12.2	4.58	4.99	5.92
27	8.00	5.20	7.74	*26.6	7.48	4.99	6.70	16.8	9.70	4.38	7.74	19.4
28	9.36	5.92	53.4	18.9	6.96	4.78	5.40	9.70	8.68	10.5	5.20	15.5
29	12.3	4.58	34.9	14.3	6.44	4.58	29.4	---------	7.48	10.7	5.92	7.74
30	7.48	4.38	10.7	15.0	6.18	14.2	11.6	---------	23.7	48.4	5.66	24.0
31	6.70	4.38	---------	23.2	---------	6.96	16.0	---------	8.68	---------	5.66	---------
Total	439.32	454.91	578.61	975.86	1,853.28	445.68	370.72	1,049.67	977.56	866.87	638.24	395.61
Mean												
Mgd	14.2	14.7	19.3	31.5	61.8	14.4	12.0	37.5	31.5	28.9	20.6	13.2
Cfs	22.0	22.7	29.9	48.7	95.6	22.3	18.6	58.0	48.7	44.7	31.9	20.4
Ac-ft	1,350	1,400	1,780	2,990	5,690	1,370	1,140	3,220	3,000	2,660	1,960	1,210

Calendar Year 1964: Max 322 Min 3.76 Mean mgd 25.4 Mean cfs 39.3 Ac-ft 28,510
Fiscal Year 1964-65: Max 326 Min 2.55 Mean mgd 24.8 Mean cfs 38.4 Ac-ft 27,770

* Discharge measurement made on this day.

Peak discharge (base, 750 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
9-18	0300	6.20	830	1,280	4- 4	2130	6.96	1,130	1,750
11- 5	1900	6.95	1,130	1,750	5- 2	1400	9.20	2,370	3,670
2- 4	0500	8.07	1,690	2,610	5-15	1500	6.13	802	1,240

5745. Kailua Stream near Kailiili

Location.--Lat 20°50'28", long 156°14'24", on right bank 0.4 mile downstream from Haiku-uka boundary trail, 2.1 miles east of Kailiili, and 3.9 miles south of Kailua.

Drainage area.--1.01 sq mi.

Records available.--June 1963 to June 1965.

Gage.--Water-stage recorder. Altitude of gage is 2,840 ft (from topographic map).

Extremes.--Maximum discharge during year, 1,150 mgd (1,780 cfs) Feb. 3 (gage height, 10.51 ft), from rating curve extended above 18 mgd by logarithmic plotting; minimum, 0.07 mgd (0.11 cfs) Jan. 13, 20, 21.
1963-65: Maximum discharge, that of Feb. 3, 1965; minimum, that of Jan. 13, 20, 21, 1965.

Remarks.--Records good except those above 40 mgd, which are fair, and those for period of no gage-height record, which are poor. Diversion above station at altitude 4,250 ft by Maui County Board of Water Supply for irrigation and domestic use.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.45	0.07	2.0	8.60
.5	.12	2.5	16.6
.6	.26	3.0	28.2
.7	.46	3.5	44.7
1.0	1.17	4.0	66.0
1.2	1.92	5.0	128
1.5	3.70	6.0	220

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.28	0.31	0.12	0.67	37.1	0.30	0.17	1.37	2.5	0.37	1.04	9.47
2	2.09	6.92	.10	.50	7.09	.37	.13	1.30	70	.48	109	4.59
3	2.29	.39	.10	.50	134	.30	.12	91.2	50	.63	13.5	*3.35
4	3.14	.26	.10	.50	12.2	.24	.11	18.8	8.0	29.1	7.10	1.38
5	.98	.68	.09	1.02	114	.21	.11	3.43	2.1	154	3.30	7.34
6	*.65	.42	.09	6.58	34.2	.20	.10	1.43	1.8	42.0	1.71	1.50
7	.46	.26	.08	4.92	84.0	.18	.09	1.04	1.0	11.2	.85	.65
8	.63	2.03	.08	*1.23	61.9	.17	.09	1.24	.78	3.16	10.5	.44
9	.42	1.30	.37	.78	32.6	.91	.09	.69	.67	3.98	1.92	.33
10	.30	.67	.78	.78	15.5	1.22	.09	.59	.56	2.12	.90	.28
11	.60	.59	1.06	.61	6.67	3.39	.09	1.50	.50	1.24	.61	.23
12	.56	.90	1.17	.44	14.7	3.44	.08	.94	.42	.85	.48	.61
13	.35	.83	.81	.35	3.70	2.81	*.07	.54	.37	.72	.39	.46
14	.37	.72	.52	.33	2.12	1.01	.33	.90	1.55	.67	.33	.30
15	2.27	.69	.59	.81	1.54	.59	.42	1.1	6.60	.54	.59	.21
16	.72	.74	9.44	1.04	1.20	13.4	.20	5.0	1.40	.46	.44	.18
17	.46	.69	8.06	.69	.95	14.0	.14	6.5	.65	.39	.31	.15
18	.33	.78	22.7	.67	1.04	1.04	.10	1.5	.50	.35	.26	.30
19	.63	.63	1.46	3.74	18.7	.76	.08	6.0	.42	.35	.23	1.64
20	1.27	.37	.90	4.34	2.91	.67	.07	4.5	.35	.35	.20	3.79
21	.65	.30	.63	7.91	1.34	.48	7.00	1.8	.31	.31	.20	1.05
22	1.58	.28	.74	5.37	.90	.37	4.25	1.5	.77	.26	.18	2.42
23	8.90	.26	.52	6.17	*.76	.31	14.7	1.2	4.26	*.23	.17	1.01
24	7.56	.23	.37	2.37	.67	.26	3.80	4.5	57.9	.20	.15	.56
25	1.84	*.21	.28	8.32	.56	.23	7.81	9.0	12.1	.18	.14	.39
26	.69	.21	.23	25.8	.50	.20	3.37	5.2	1.84	.17	.14	.37
27	.52	.20	.21	5.05	.44	.17	.78	4.3	.88	.15	.35	.52
28	.61	.18	6.10	1.54	.39	.15	.52	1.3	.69	.56	.28	.54
29	7.89	.17	7.68	1.04	.35	.14	12.6	---------	.56	.52	.23	.37
30	.56	.14	1.26	.81	.31	.24	3.48	---------	.50	1.96	.33	.68
31	.37	.13	---------	.81	---------	.23	5.66	---------	.44	---------	.33	---------
Total	50.97	22.49	66.64	95.69	592.34	47.99	66.65	178.37	230.42	257.50	156.16	45.11
Mean												
Mgd	1.64	0.725	2.22	3.09	19.7	1.55	2.15	6.37	7.43	8.58	5.04	1.50
Cfs	2.54	1.12	3.43	4.78	30.5	2.40	3.33	9.86	11.5	13.3	7.80	2.32
Ac-ft	156	69	205	294	1,820	147	205	547	707	790	479	138

Calendar Year 1964:	Max	134	Min	0.08	Mean mgd	4.42	Mean cfs	6.84	Ac-ft	4,970
Fiscal Year 1964-65:	Max	154	Min	0.07	Mean mgd	4.96	Mean cfs	7.67	Ac-ft	5,560

Peak discharge (base, 200 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
11-3	1100	8.24	573	887	3-2	-	-	-	-
11-5	2130	6.77	316	489	4-5	0400	10.16	1,050	1,620
11-8	0500	6.63	297	460	5-2	1430	10.40	1,120	1,730
2-3	1730	10.51	1,150	1,780					

* Discharge measurement made on this day.
Note.--No gage-height record Feb. 12 to Mar. 8.

5850. Hoolawanui Stream near Huelo

Location.--Lat 20°53'15", long 156°14'55", on right bank 250 ft upstream from Wailoa ditch intake, 2 miles west of Kailua, and 2 miles southwest of Huelo.

Drainage area.--1.34 sq mi.

Records available.--December 1910 to June 1965. Monthly discharge only for some periods, published in WSP 1319.

Gage.--Water-stage recorder and concrete control. Datum of gage is 1,219.42 ft above mean sea level (East Maui Irrigation Co. bench mark). Prior to June 20, 1914, staff gage at site 180 ft downstream at different datum. June 20, 1914, to Oct. 24, 1933, water-stage recorder at site 80 ft downstream at datum 4.43 ft lower.

Average discharge.--54 years (1911-65), 7.77 mgd (12.0 cfs).

Extremes.--Maximum discharge during year, 3,060 mgd (4,730 cfs) May 2 (gage height, 5.79 ft), from rating curve extended above 92 mgd as explained below; minimum, 0.81 mgd (1.25 cfs) Jan. 21.
1910-65: Maximum discharge, 3,240 mgd (5,010 cfs) Apr. 27, 1950 (gage height, 5.94 ft), from rating curve extended above 92 mgd by logarithmic plotting; minimum, 0.15 mgd (0.23 cfs) Oct. 25, 1917.

Remarks.--Records good except those for periods of no gage-height record and those above 200 mgd, which are fair. No diversion above station. All low flow diverted into Wailoa ditch (see p. 135) 250 ft below station for domestic supply, power, and irrigation in central Maui.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.2	0.55	0.9	17.2
.3	1.15	1.2	36.7
.4	2.20	1.5	65.5
.5	3.76	2.0	140
.6	5.95	2.5	260
.7	8.75		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.46	2.33	1.33	1.9	78	2.60	1.83	2.60	3.39	2.74	3.91	5.06
2	2.67	5.82	*1.24	1.8	16.6	3.06	1.72	3.38	35.4	2.90	1.06	3.74
3	3.39	2.07	1.15	1.7	66.6	*2.46	1.61	108	76.6	2.60	17.8	3.66
4	6.84	1.83	1.24	2.0	23.4	2.20	1.61	16.0	13.5	32.1	7.56	2.46
5	2.60	9.44	1.07	2.6	141	2.07	1.51	15.0	8.79	103	5.95	6.61
6	1.95	2.74	1.00	15	51.6	2.07	1.42	8.15	8.65	43.8	9.95	2.90
7	1.72	2.20	1.07	18	64.1	1.95	1.54	6.73	5.44	19.3	4.54	1.95
8	3.49	7.73	1.15	4.5	39.5	1.95	1.42	5.44	4.76	12.5	9.22	1.72
9	1.72	3.22	2.25	4.0	34.1	4.14	1.33	4.98	4.13	21.4	4.54	1.61
10	1.51	2.46	2.0	3.6	26.5	2.46	1.24	6.16	3.76	9.54	3.58	1.51
11	3.58	3.37	2.2	3.3	19.4	7.32	1.24	11.1	3.39	7.00	3.22	1.42
12	1.95	6.80	2.8	3.1	26.6	10.2	1.15	5.20	3.22	5.95	2.90	1.83
13	1.61	3.06	2.4	2.8	14.0	9.31	1.36	3.94	3.22	5.20	2.60	1.42
14	1.72	2.74	1.9	3.0	9.94	7.42	2.68	24.8	8.04	4.54	2.46	1.33
15	4.78	2.60	1.4	4.0	8.15	3.22	1.24	5.95	10.5	3.94	1.32	1.24
16	1.83	4.22	6.0	6.0	7.00	25.7	1.07	10.0	3.94	3.58	3.22	1.24
17	1.61	3.67	4.5	3.3	5.95	9.29	.93	9.49	3.22	3.22	2.46	1.15
18	1.51	3.73	15	46	6.47	3.94	.87	4.98	2.90	3.22	2.20	1.79
19	2.20	2.46	3.6	17	43.2	3.94	.87	5.20	2.74	*3.44	2.07	2.47
20	3.72	2.20	2.4	11	9.14	3.22	.87	4.98	2.60	3.22	1.95	2.60
21	1.83	2.07	2.0	14	6.73	2.9	*7.34	3.94	2.46	2.74	1.95	1.61
22	3.58	2.07	1.8	11	5.69	2.6	6.42	3.76	7.58	2.46	1.83	2.46
23	8.97	2.07	1.7	10	4.98	2.46	18.7	3.58	8.79	2.33	1.72	*1.51
24	3.06	1.83	1.6	8.0	4.54	2.33	4.76	5.20	45.1	2.20	1.61	1.24
25	2.46	1.72	1.5	9.0	4.13	2.46	4.92	4.98	13.9	2.07	1.61	1.15
26	2.07	1.61	1.4	13	3.76	2.20	3.72	5.70	6.73	1.95	1.72	1.24
27	1.95	1.61	1.4	8.5	3.39	2.07	2.33	4.98	4.98	1.83	1.83	3.06
28	2.07	1.51	10	7.5	3.22	1.95	2.07	3.58	4.13	2.90	1.51	2.46
29	2.60	1.42	3.5	6.47	2.90	1.83	7.20	---------	3.58	2.33	1.51	1.61
30	2.46	1.42	2.1	5.96	2.74	4.02	3.22	---------	4.32	7.01	1.51	3.38
31	1.61	1.33	---------	6.21	---------	2.20	4.76	---------	3.22	---------	1.72	---------
Total	85.52	93.35	82.70	254.24	733.33	135.54	92.95	441.80	312.98	321.01	227.85	67.43
Mean												
Mgd	2.76	3.01	2.76	8.20	24.4	4.37	3.00	15.8	10.1	10.7	7.35	2.25
Cfs	4.27	4.66	4.27	12.7	37.8	6.76	4.64	24.4	15.6	16.6	11.4	3.48
Ac-ft	262	286	254	780	2,250	416	285	1,360	960	985	699	207

Calendar Year 1964:	Max	141	Min	1.00	Mean mgd	7.31	Mean cfs	11.3	Ac-ft	8,220
Fiscal Year 1964-65:	Max	160	Min	0.87	Mean mgd	7.80	Mean cfs	12.1	Ac-ft	8,740

* Discharge measurement made on this day.
Note.--No gage-height record Sept. 10 to Oct. 28, Nov. 1.

Peak discharge (base, 400 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
11- 5	1930	3.48	697	1,080	4- 5	0700	3.07	468	724
2- 4	0500	4.57	1,550	2,400	5- 2	1430	5.79	3,060	4,730
2-14	1630	2.99	436	675	5-15	1600	3.01	444	687

5870. Honopou Stream near Huelo

Location.--Lat 20°53'20", long 156°15'20", on left bank 75 ft upstream from Wailoa ditch intake, 2.2 miles southwest of Huelo, and 2.5 miles west of Kailua.

Drainage area.--0.64 sq mi.

Records available.--December 1910 to June 1965. Monthly discharge only for some periods, published in WSP 1319.

Gage.--Water-stage recorder and concrete control. Datum of gage is 1,208 ft above mean sea level (by vertical angles). Prior to June 19, 1914, staff gage at same site and datum.

Average discharge.--54 years (1911-65), 3.09 mgd (4.78 cfs).

Extremes.--Maximum discharge during year, 236 mgd (365 cfs) Nov. 5 (gage height, 3.24 ft), from rating curve extended above 70 mgd as explained below; minimum, 0.42 mgd (0.65 cfs) June 26.
1910-65: Maximum discharge, 3,690 mgd (5,710 cfs) Nov. 18, 1930 (gage height, 7.28 ft), from rating curve extended above 70 mgd by test on model of station site; minimum, 0.01 mgd (0.02 cfs) for several days in 1933, 1934.

Remarks.--Records good. No diversion above station.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.5	0.48	1.2	9.90
.6	1.26	1.7	23.1
.7	2.29	2.2	45.5
.9	4.92		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.92	0.92	0.60	1.00	25.7	1.46	1.00	1.16	1.56	*1.56	1.76	1.85
2	.76	1.56	*.60	1.00	7.31	1.56	.92	1.72	3.69	1.66	11.6	1.16
3	1.00	.84	.60	.92	10.5	*1.26	.84	32.8	17.8	1.46	5.95	1.36
4	1.96	.76	.68	1.08	7.63	1.16	.84	43.6	4.07	3.00	2.90	1.00
5	1.00	3.37	.60	1.46	36.5	1.08	.76	7.88	3.78	14.0	2.18	1.74
6	.68	1.16	.54	4.75	15.8	1.00	.76	5.38	4.35	10.8	2.86	1.00
7	.68	1.00	.60	5.44	13.7	1.00	1.00	4.35	2.77	6.41	2.06	.76
8	1.16	2.94	.60	1.86	10.5	.92	.84	3.64	2.53	5.70	2.94	.68
9	.68	1.46	.92	1.76	10.4	1.66	.68	3.38	2.41	9.72	1.96	.68
10	.60	1.08	.92	1.66	8.53	1.00	.68	4.45	2.18	5.07	1.86	.60
11	1.16	1.36	1.08	1.56	7.77	2.16	.60	5.53	2.06	4.07	1.76	.60
12	.76	2.29	1.16	1.46	9.68	4.37	.60	2.90	1.96	3.64	1.66	.68
13	.68	1.36	1.00	1.26	6.97	3.32	.68	2.53	1.86	3.26	1.56	.60
14	.68	1.26	.84	1.36	5.53	3.36	1.82	11.0	4.03	2.90	1.46	.54
15	2.04	1.16	.68	1.96	4.64	1.56	.68	3.50	3.72	2.53	1.84	.54
16	.76	1.66	2.51	2.89	4.07	8.08	.54	3.70	1.86	2.29	1.46	.54
17	.68	1.66	2.08	1.46	3.64	3.36	.54	4.05	1.76	2.06	1.26	.54
18	.60	1.72	6.11	14.4	3.50	1.96	.48	2.90	1.66	1.96	1.26	.68
19	.92	1.16	1.46	9.07	13.6	1.96	.48	2.90	1.56	*1.96	1.16	.92
20	1.36	1.08	1.36	5.69	4.64	1.76	.48	2.65	1.46	1.86	1.08	1.00
21	.76	1.00	1.16	7.28	3.78	1.56	3.88	2.29	1.36	1.66	1.00	.60
22	1.08	1.08	1.08	5.38	3.38	1.46	2.88	2.18	2.99	1.46	1.00	.68
23	2.23	1.08	1.00	5.23	3.14	1.36	6.22	2.06	2.81	1.36	.92	*.54
24	1.00	.92	.92	4.07	2.77	1.26	2.03	2.41	12.5	1.26	.84	.48
25	.92	.84	.92	4.59	2.41	1.36	1.74	2.18	3.78	1.16	.84	.48
26	.84	.84	.84	6.42	2.29	1.08	1.36	2.06	2.53	1.08	.84	.48
27	.76	.84	.84	4.21	2.06	1.08	1.08	1.96	2.29	1.08	.92	1.36
28	.84	.84	3.94	3.93	1.86	1.00	1.00	1.66	2.06	1.46	.76	.92
29	.92	.76	2.06	3.26	1.66	.92	2.79	---------	1.96	1.08	.76	.54
30	.68	.68	1.08	3.46	1.56	1.99	1.36	---------	2.50	2.90	.76	1.14
31	.68	.68	---------	3.26	---------	1.08	1.56	---------	1.86	---------	.84	---------
Total	29.79	39.36	38.78	113.13	235.52	58.14	41.12	166.82	103.71	100.41	60.05	24.69
Mean												
Mgd	0.961	1.27	1.29	3.65	7.85	1.88	1.33	5.96	3.35	3.35	1.94	0.823
Cfs	1.49	1.96	2.00	5.65	12.1	2.91	2.06	9.22	5.18	5.18	3.00	1.27
Ac-ft	91	121	119	347	723	178	126	512	318	308	184	76

Calendar Year 1964:	Max	36.5	Min	0.54	Mean mgd	2.72	Mean cfs	4.21	Ac-ft	3,060
Fiscal Year 1964-65:	Max	43.6	Min	0.48	Mean mgd	2.77	Mean cfs	4.29	Ac-ft	3,100

* Discharge measurement made on this day.

Peak discharge (base, 130 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-18	2000	2.91	133	206	2-4	0330	3.19	216	334
11- 5	1900	3.24	236	365	5-2	1530	3.13	196	303

5880. Wailoa ditch at Honopou, near Huelo

Location.--Lat 20°53'20", long 156°15'19", on right bank 100 ft downstream from intake at Honopou Stream, 0.5 mile west of Lupi, and 2.2 miles southwest of Huelo.

Records available.--November 1922 to June 1965.

Gage.--Water-stage recorder. Datum of gage is 1,208 ft above mean sea level (by vertical angles).

Average discharge.--42 years (1923-65), 112 mgd (173 cfs).

Extremes.--1922-65: Maximum daily discharge, 195 mgd (302 cfs) for several days in 1954, 1955, and 1956; no flow Jan. 24-27, 1923.

Remarks.--Records good. Wailoa ditch receives water from Koolau ditch at Alo Stream and from all streams from there west to Halehaku Gulch at altitude of about 1,200 ft. Water is used for domestic supply, power and irrigation in central Maui.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	151	114	53.0	102	121	76.3	60.6	84.4	110	80.9	180	160
2	148	184	52.0	97.0	126	101	58.7	81.5	182	76.0	182	174
3	180	109	49.4	100	125	*77.4	59.8	150	175	71.1	185	166
4	182	83.2	70.4	101	124	72.4	56.9	109	185	86.2	186	151
5	156	172	52.7	150	128	67.8	51.8	123	184	184	184	165
6	118	140	46.7	188	128	62.6	49.7	119	184	176	184	172
7	95.0	102	51.8	188	128	61.0	49.1	118	158	178	167	111
8	157	175	57.8	163	127	59.8	47.6	118	127	180	152	85.6
9	97.0	166	136	124	127	143	47.0	102	106	182	181	76.6
10	83.2	113	131	136	128	117	44.9	87.1	98.2	180	142	67.8
11	143	129	157	103	128	113	46.1	130	88.4	162	102	64.2
12	117	185	146	88.0	128	182	43.4	118	82.0	134	89.6	125
13	86.4	157	120	79.6	128	160	42.2	93.4	77.5	114	81.4	76.0
14	94.6	143	143	90.0	127	146	56.9	98.8	161	130	76.9	66.9
15	164	145	96.7	168	126	126	45.5	123	181	97.0	106	59.0
16	102	184	169	185	126	124	40.4	90.1	133	85.2	132	61.8
17	81.4	164	185	118	123	146	38.0	78.0	92.7	79.0	84.0	56.3
18	75.6	157	188	110	124	121	36.5	116	81.1	78.1	72.8	78.2
19	142	118	170	188	128	109	33.9	121	74.8	*119	67.5	155
20	160	94.2	154	188	130	109	32.9	124	70.2	132	63.9	154
21	106	83.2	117	188	129	120	75.1	111	66.6	79.6	60.2	104
22	94.6	90.3	102	188	125	113	141	95.0	93.6	70.8	56.6	178
23	187	90.9	86.8	188	132	74.4	145	85.2	179	66.0	53.6	*134
24	184	73.6	77.5	187	125	69.3	176	88.0	187	62.2	51.8	90.6
25	153	67.5	76.6	188	113	88.0	121	92.4	182	58.1	50.6	82.0
26	102	63.6	74.0	187	103	67.8	158	129	164	55.7	61.4	79.0
27	88.8	75.7	86.0	188	95.8	63.3	90.0	177	124	53.3	86.2	157
28	112	96.2	176	187	89.6	56.3	71.4	117	102	130	66.3	143
29	128	66.3	186	163	82.8	53.0	77.3	---------	91.8	112	59.4	88.0
30	96.6	57.5	142	152	79.9	126	126	---------	138	169	78.0	143
31	78.1	55.1	----------	144	----------	80.5	161	---------	102	----------	67.6	----------
Total	3.863.3	3.654.3	3.353.4	4.626.6	3.605.1	3.085.9	2.283.7	3.078.9	3.980.9	3.381.2	3.310.8	3.424.0
Mean												
Mgd	125	118	112	149	120	99.5	73.7	110	128	113	107	114
Cfs	193	183	173	231	186	154	114	170	198	175	166	176
Ac-ft	11.860	11.210	10.290	14.200	11.060	9.470	7.010	9.450	12.220	10.380	10.160	10.510

Calendar Year 1964:	Max	188	Min	46.7	Mean mgd	121	Mean cfs	187	Ac-ft	136.100
Fiscal Year 1964-65:	Max	188	Min	32.9	Mean mgd	114	Mean cfs	176	Ac-ft	127.800

* Discharge measurement made on this day.

5890. New Hamakua ditch at Honopou, near Huelo

Location.--Lat 20°53'28", long 156°15'22", on right bank 15 ft upstream from tunnel portal, 600 ft downstream from Honopou Stream crossing, and 2.1 miles southwest of Huelo.

Records available.--January 1918 to June 1965.

Gage.--Water-stage recorder. Datum of gage is 1,170 ft above mean sea level (by vertical angles). Prior to May 14, 1921, at site 300 ft upstream at different datum. May 15, 1921, to Mar. 18, 1962, at present site at datum 1.00 ft higher.

Average discharge.--47 years, 24.7 mgd (38.2 cfs).

Extremes.--1918-65: Maximum daily discharge, 116 mgd (179 cfs) Feb. 13, 14, 27, 1932; no flow at times.

Remarks.--Records good. Ditch diverts from streams between Waikamoi Stream and Halehaku Gulch above Center and Lowrie ditches for irrigation in central Maui.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	15.4	1.94	0.47	1.15	100	1.29	1.08	1.91	2.47	2.56	71.1	64.5
2	25.3	64.3	.43	1.08	99.0	1.52	1.29	1.45	94.6	2.36	74.4	49.3
3	60.8	1.41	.39	.90	99.2	*1.22	1.68	36.0	*100	2.07	95.0	54.2
4	82.0	.79	.39	1.22	99.0	1.08	1.52	17.2	94.8	18.2	94.8	19.7
5	3.30	68.5	.39	11.2	101	1.02	1.45	2.17	69.2	99.0	81.9	53.4
6	1.15	8.68	.35	91.0	98.8	.90	1.29	1.99	73.1	98.6	78.1	21.8
7	.96	1.15	.32	87.2	98.6	.85	1.37	1.76	3.81	97.8	20.4	1.02
8	38.2	64.0	.35	8.86	98.4	.85	1.22	1.06	2.76	92.0	39.6	.79
9	1.29	17.0	24.4	3.99	99.0	33.6	1.08	.51	2.46	98.8	32.6	.74
10	1.02	1.60	10.3	1.99	99.6	6.65	1.02	.51	2.17	78.9	3.64	.64
11	39.4	18.1	12.7	1.68	100	30.0	.96	.47	1.99	12.5	2.07	.59
12	2.47	68.9	8.89	1.45	100	64.1	.96	.47	1.84	3.51	1.84	4.05
13	1.15	3.30	.92	1.29	100	11.1	.90	.47	1.68	2.95	1.60	.69
14	1.08	1.60	6.08	1.29	99.0	5.32	1.91	.47	20.0	2.76	1.45	.55
15	47.9	9.47	1.26	32.5	90.0	4.20	1.02	.39	95.4	2.36	36.5	.55
16	1.52	25.0	56.4	63.0	62.0	3.97	.85	.43	11.0	2.17	8.89	.51
17	1.15	36.4	71.3	2.30	39.4	9.64	.74	.47	1.99	1.91	1.99	.47
18	1.02	15.6	94.8	20.9	41.8	4.74	.59	.59	1.76	1.84	1.68	.96
19	12.8	1.37	30.3	98.6	100	2.36	.32	.69	1.60	*26.7	1.52	41.8
20	*42.9	1.02	9.27	97.2	98.4	1.84	.32	.69	1.45	33.0	1.37	41.8
21	1.15	.90	1.45	98.2	71.8	6.94	16.1	.69	1.37	1.99	1.22	1.2
22	6.62	.90	1.08	96.6	31.7	7.03	50.7	12.9	14.0	1.68	1.08	67.3
23	78.2	.85	.90	95.8	10.4	1.22	50.1	12.5	76.5	1.45	.96	*2.98
24	47.5	.79	.85	91.0	2.95	1.15	48.8	40.4	93.9	1.22	.90	.55
25	11.6	.69	.79	89.4	2.56	2.12	13.6	95.0	93.4	1.15	.85	.47
26	1.15	.69	.79	97.4	2.17	1.15	42.3	84.5	13.3	1.02	.96	.43
27	.96	.64	.74	86.2	1.91	1.02	1.60	58.4	3.16	.90	1.37	5.21
28	1.08	.64	64.5	55.6	1.76	.96	1.22	3.74	2.76	20.2	.90	9.32
29	3.09	.59	8.06	5.04	1.60	.85	77.8	---------	2.46	5.16	.74	.84
30	.90	.55	6.06	15.0	1.45	13.8	5.14	---------	35.9	75.8	.79	29.6
31	.79	.51	---------	83.2	---------	1.72	18.4	---------	3.48	---------	.74	---------
Total	533.85	417.88	414.93	1342.24	1951.50	224.21	347.33	377.83	924.31	790.56	660.96	475.96
Mean												
Mgd	17.2	13.5	13.8	43.3	65.0	7.23	11.2	13.5	29.8	26.4	21.3	15.9
Cfs	26.6	20.9	21.4	67.0	101	11.2	17.3	20.9	46.1	40.8	33.0	24.6
Ac-ft	1640	1280	1270	4120	5990	688	1070	1160	2840	2430	2030	1460

Calendar Year 1964:	Max	102	Min	0.32	Mean mgd	29.3	Mean cfs	45.3	Ac-ft	32,920		
Fiscal Year 1964-65:	Max	101	Min	0.32	Mean mgd	23.2	Mean cfs	35.9	Ac-ft	25,980		

* Discharge measurement made on this day.

5900. Old Hamakua ditch at Honopou, near Huelo

Location.--Lat 20°53'31", long 156°15'16", on right bank 400 ft downstream from Honopou Stream and Wailoa ditch trail crossing in Honopou Gulch, 2.0 miles southwest of Huelo, and 5.0 miles east of Haiku.

Records available.--January 1918 to June 1922, November 1936 to June 1965 (discontinued).

Gage.--Water-stage recorder and modified Parshall flume. Datum of gage is 1,117 ft above mean sea level (by verical angles).

Average discharge.--32 years (1918-22, 1937-65), 1.97 mgd (3.05 cfs).

Extremes.--1918-22, 1936-65: Maximum daily discharge, 39.5 mgd (61.1 cfs) Apr. 7, 1938; no flow at times.

Remarks.--Records fair except those for period of no gage-height record, which are poor. Ditch intakes are at Hoolawanui and Honopou Streams, but Wailoa and New Hamakua ditches divert most of flow. Water stored in reservoirs to be used for irrigation in central Maui.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.02	0.02	0	0	0.12	0.03	0.04	0.04	0.01	0.01	0.03	0
2	.01	.04	*0	0	6.86	.03	.03	.04	.02	.01	.04	.02
3	.03	.03	0	0	14.2	.03	.02	.16	.06	.01	.05	.02
4	.04	.02	0	0	13.8	.03	.02	.10	.02	.01	.03	.02
5	.04	.04	0	0	14.8	.03	.02	.02	.03	.04	.03	.02
6	.03	.03	0	1.33	13.4	.02	.02	.02	.04	.04	.02	.02
7	.03	.02	0	6.66	15.8	.02	.02	.02	.03	.03	.02	.01
8	.04	.04	0	.10	15.8	.02	.02	.02	.02	.03	.02	.01
9	.04	.03	0	.06	15.6	.06	.01	.02	.02	.04	.02	0
10	.03	.03	0	.04	15.4	.10	.01	.02	.02	.02	.02	0
11	.04	.03	0	.04	15.3	.07	.01	.04	.02	.02	.02	0
12	.04	.03	0	.04	15.6	.13	.01	.02	.01	.01	.02	0
13	.03	.01	0	.04	15.3	.10	.01	.02	.01	.01	.02	0
14	.02	.01	0	.04	14.8	.08	.02	.04	.02	.01	.02	0
15	.05	0	0	.09	5.50	.03	.01	.02	.04	.01	.02	.01
16	.04	.01	.01	2.44	.46	.07	.01	.02	.04	.01	.02	.02
17	.04	.01	.02	.09	.26	.06	.01	.02	.03	.01	.01	.02
18	.03	.01	.04	2.84	.44	.02	.01	.02	.03	.01	.01	.03
19	.03	.01	.01	5.40	15.4	.02	.01	.02	.02	*.01	.01	a .04
20	.04	.01	.01	.17	14.6	.01	.01	.02	.02	.02	0	a .05
21	.03	0	0	.14	2.64	.01	.04	.02	.02	.01	0	a .04
22	.03	0	0	.08	.14	.01	.05	.02	.03	.01	0	a .06
23	.04	0	0	.06	.09	.01	.07	.02	.04	.01	0	.04
24	.04	0	0	.04	.06	.01	.05	.02	.05	.01	0	.02
25	.04	0	0	.04	.05	.02	.04	.03	.04	.01	0	.02
26	.04	0	0	.04	.04	.01	.05	.02	.02	0	0	.02
27	.03	0	0	.03	.04	.01	.04	.02	.01	0	0	.04
28	.03	0	.01	.02	.04	.01	.04	.01	.01	0	0	.04
29	.02	0	.01	.01	.04	.01	.05	---------	.01	0	0	.03
30	.02	0	0	.01	.03	.04	.04	---------	.02	.03	0	.04
31	.02	0	----------	.01	----------	.04	.04	---------	.01	----------	0	----------
Total	1.01	0.43	0.11	19.86	226.61	1.14	0.83	0.86	0.77	0.44	0.43	0.64
Mean												
Mgd	0.033	0.014	0.004	0.641	7.55	0.037	0.027	0.031	0.025	0.015	0.014	0.021
Cfs	0.051	0.022	0.006	0.992	11.7	0.057	0.042	0.048	0.039	0.023	0.022	0.032
Ac-ft	3.1	1.3	0.3	61	695	3.5	2.5	2.6	2.4	1.4	1.3	2.0

Calendar Year 1964:	Max	15.8	Min	0	Mean mgd	0.716	Mean cfs	1.11	Ac-ft	804		
Fiscal Year 1964-65:	Max	15.8	Min	0	Mean mgd	0.694	Mean cfs	1.07	Ac-ft	777		

* Observation of no flow made on this day.
a No gage-height record.

5920. Lowrie ditch at Honopou Gulch, near Huelo

Location.--Lat 20°54'57", long 156°15'07", on left bank 0.2 mile downstream from siphon across Honopou Stream, 1.6 miles west of Huelo, and 2.7 miles northwest of Kailua.

Records available.--January 1910 to March 1927, February 1930 to June 1965. Published as "at Opana weir, near Huelo" 1910-27.

Gage.--Water-stage recorder and concrete control. Datum of gage is 598.0 ft above mean sea level, datum of 1929. Jan. 1, 1910, to Mar. 31, 1927, at site 1.5 miles downstream at different datum.

Average discharge.--51 years (1910-26, 1930-65), 26.6 mgd (41.2 cfs).

Extremes.--1910-27, 1930-65: Maximum daily discharge, 75 mgd (116 cfs) Oct. 31, 1921; no flow at times.

Remarks.--Records good. Lowrie ditch receives water from Center ditch at Nailiilihaele Stream and diverts from additional streams westward to Maliko Gulch for irrigation in central Maui.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	25.7	9.16	5.68	12.4	73.4	14.0	9.60	13.7	11.2	28.8	41.6	37.1
2	15.7	38.1	5.86	12.0	72.1	16.1	8.72	18.3	48.8	25.1	52.7	41.8
3	23.5	10.3	5.50	8.50	68.9	13.7	8.50	26.3	57.8	16.6	45.5	29.1
4	46.8	10.5	6.22	8.80	68.0	12.2	8.29	5.79	53.3	19.0	54.5	20.8
5	11.4	47.1	5.68	13.0	61.4	11.2	8.94	2.02	25.8	63.1	44.4	32.6
6	8.26	20.0	5.32	63.1	44.2	10.5	9.82	1.52	47.3	62.0	46.7	22.5
7	15.2	13.4	5.68	65.4	68.0	10.0	11.1	1.33	20.9	56.4	31.0	10.2
8	30.2	43.1	5.86	41.0	68.0	10.0	8.72	1.24	18.2	43.3	34.3	16.3
9	11.8	16.9	21.7	21.2	66.7	34.1	7.87	1.17	17.2	57.4	34.8	10.6
10	12.9	14.6	14.1	16.6	62.9	29.8	7.45	1.17	17.7	53.6	12.3	10.5
11	28.7	16.1	12.9	14.8	61.7	20.7	7.45	1.74	16.1	39.0	7.66	8.50
12	12.3	42.5	13.6	16.3	69.1	25.1	7.24	1.08	12.7	20.7	7.24	7.03
13	14.0	15.0	10.5	14.3	66.9	2.35	7.45	1.00	12.4	25.7	6.82	6.67
14	11.0	13.7	12.8	14.8	53.8	1.82	9.60	2.24	20.3	29.0	7.88	8.33
15	34.6	11.4	11.6	29.2	28.8	1.70	7.03	1.08	55.5	28.8	23.1	8.73
16	11.4	12.0	40.8	40.1	28.5	5.17	6.40	1.00	32.2	16.1	10.4	9.11
17	*12.7	22.1	44.8	13.5	24.3	1.24	6.22	.93	15.5	13.2	9.72	7.82
18	8.08	15.1	67.2	18.7	25.4	3.91	6.04	.86	16.1	13.0	4.30	7.74
19	11.2	12.1	22.1	59.6	66.2	6.61	6.22	.79	14.2	20.3	4.00	18.2
20	29.9	15.6	14.7	57.8	68.3	11.3	5.86	.79	13.0	*38.9	4.15	25.3
21	14.3	8.50	19.6	57.8	53.6	13.7	18.1	.72	11.2	15.0	5.14	11.0
22	14.0	8.29	15.6	57.6	38.8	6.47	43.4	7.09	21.6	13.0	13.5	38.9
23	47.4	7.87	15.4	57.6	36.0	1.92	33.9	19.0	55.6	12.0	11.7	11.6
24	41.3	7.24	11.8	51.4	49.1	1.70	25.7	16.3	60.3	11.0	6.26	*7.45
25	21.8	6.82	7.24	50.1	29.0	2.13	*21.8	28.8	54.5	10.3	4.30	8.59
26	12.2	6.61	7.45	58.0	20.4	1.70	34.8	21.8	24.4	9.60	5.28	5.32
27	13.5	7.03	6.82	50.9	18.5	5.45	15.0	24.3	16.6	9.60	12.2	11.2
28	16.1	6.82	38.3	34.0	16.9	13.3	14.8	12.2	21.3	13.8	10.7	11.0
29	14.6	6.61	57.1	23.4	15.5	13.2	38.0	---------	28.2	14.0	10.0	10.4
30	11.5	6.04	13.7	27.4	14.5	19.7	17.6	---------	44.9	45.9	9.16	18.0
31	8.08	5.86	---------	64.7	---------	12.4	15.0	---------	22.9	---------	9.82	---------
Total	590.12	476.45	525.61	1074.00	1438.9	333.17	436.62	214.26	887.7	824.20	581.13	472.39
Mean												
Mgd	19.0	15.4	17.5	34.6	48.0	10.7	14.1	7.65	28.6	27.5	18.7	15.7
Cfs	29.4	23.8	27.1	53.5	74.3	16.6	21.8	11.8	44.3	42.5	28.9	24.3
Ac-ft	1810	1460	1610	3300	4420	1020	1340	658	2720	2530	1780	1450

Calendar Year 1964:	Max	73.4	Min	1.24	Mean mgd	22.7	Mean cfs	35.1	Ac-ft	25.440		
Fiscal Year 1964-65:	Max	73.4	Min	0.72	Mean mgd	21.5	Mean cfs	33.3	Ac-ft	24.100		

* Discharge measurement made on this day.

5940. Haiku ditch at Honopou Gulch, near Kailua

Location.--Lat 20°55'05", long 156°14'55", on right bank on west side of Honopou Gulch, 160 ft below new Government Road, 2.5 miles northwest of Kailua, and 5 miles east of Haiku.

Records available.--January 1910 to June 1912, January 1913 to December 1928, February 1930 to June 1965. Published as "at Peahi weir, near Huelo" January 1910 to June 1919, as "at Manawai Gulch, near Peahi" July 1919 to December 1928, and as "at Kapalalaea Gulch, near Huelo" February 1930 to January 1940. Monthly discharge only for some periods, published in WSP 1319.

Gage.--Water-stage recorder and concrete control. Datum of gage is 421.54 ft above mean sea level, datum of 1929. Jan. 1, 1910, to Oct. 6, 1914, at site at Peahi weir on old Haiku ditch at different datum. Oct. 7, 1914, to Dec. 31, 1928, at site 2.9 miles downstream at different datum. Feb. 19, 1930, to Feb. 20, 1940, at site 0.9 mile downstream at different datum.

Average discharge.--51 years (1910-12, 1913-14, 1915-28, 1930-65), 18.3 mgd (28.3 cfs).

Extremes.--1910-28, 1930-65: Maximum daily discharge, 135 mgd (209 cfs) Nov. 13, 1934, Jan. 8, 9, Feb. 25-27, 1935, Jan. 27, 1938; no flow at times.

Remarks.--Records good except those for period of no gage-height record, which are fair. Ditch diverts water from all streams between Nailiilihaele Stream and Maliko Gulch for irrigation in central Maui.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	5.24	0.40	0.28	1.71	63.5	*2.10	1.57	2.80	1.85	2.53	10.7	32.4
2	1.13	19.9	.28	1.57	67.6	2.10	2.19	4.95	36.5	2.02	26.5	32.5
3	1.48	.48	.28	1.50	67.2	1.71	2.28	9.80	*41.2	1.78	42.0	10.5
4	23.0	.37	.34	1.64	68.2	1.57	2.02	.60	20.2	14.9	47.9	2.45
5	.85	41.5	.30	3.48	67.3	1.50	1.36	.20	3.78	62.7	36.6	30.5
6	.58	1.63	.26	56.1	62.6	1.43	1.29	.16	20.3	43.7	35.3	5.14
7	.51	.75	.28	56.1	68.8	1.36	2.20	.14	2.90	39.5	7.37	1.10
8	11.3	27.8	.28	4.03	68.8	1.29	1.64	.14	2.62	13.5	16.3	1.05
9	.51	1.31	9.86	1.57	68.8	8.97	1.36	.14	2.53	36.6	15.1	1.05
10	.40	.85	.40	1.36	68.5	8.54	1.29	.12	3.69	18.8	9.79	.90
11	14.2	.75	.37	1.29	68.2	8.67	1.22	.20	2.44	5.38	11.8	.85
12	.91	16.1	.54	1.05	69.2	8.60	1.22	.14	2.10	3.94	10.7	.95
13	.58	1.00	.40	.95	67.2	1.05	1.36	.12	2.42	3.82	10.0	.85
14	.62	.80	.40	1.05	53.4	.75	1.78	.20	3.97	3.50	7.50	.80
15	13.3	.75	.34	4.84	18.5	14.1	1.43	.12	40.5	3.30	19.2	.80
16	.65	.95	33.3	17.9	10.0	9.73	1.22	.10	2.84	3.10	21.3	a.7
17	*.58	.90	30.4	1.50	8.09	.54	1.15	.10	1.43	2.90	8.95	a.6
18	.54	.80	58.1	9.51	6.51	12.1	1.15	.09	1.36	3.00	12.0	a.6
19	.62	.58	2.97	52.1	60.5	.90	1.15	.10	1.22	14.4	10.9	a2.0
20	7.04	.51	2.28	34.3	50.0	.99	1.10	.09	1.15	26.6	9.61	a5.2
21	.51	.51	2.02	37.4	6.99	.36	7.91	.09	1.10	2.80	7.88	a1.3
22	.51	.58	1.78	*32.3	5.18	.14	23.5	.08	5.18	2.53	1.85	a12
23	39.4	.48	1.71	40.4	5.18	.09	10.6	1.58	37.3	2.36	1.64	a.8
24	8.79	.40	1.64	13.3	4.18	.08	1.05	3.20	41.3	2.19	4.14	.58
25	1.18	.30	1.57	22.7	3.20	.09	*7.50	2.64	38.9	2.10	5.74	.58
26	.54	.30	1.57	36.6	2.90	.06	15.8	.51	14.5	2.02	5.91	.58
27	.48	.37	1.36	24.4	2.70	.04	3.10	.40	8.48	1.94	1.50	1.22
28	.58	.34	37.0	5.32	2.53	1.14	2.90	1.59	2.70	2.36	1.36	1.00
29	.48	.30	50.1	4.18	2.36	1.78	21.7	---------	2.70	2.10	1.36	.75
30	.44	.30	2.19	9.67	2.28	2.48	3.92	---------	23.2	39.9	1.36	4.34
31	.40	.28	---------	38.7	---------	1.71	3.20	---------	3.60	---------	1.36	---------
Total	137.35	122.29	242.60	518.52	1120.40	95.97	131.16	30.40	373.96	366.27	403.62	154.09
Mean												
Mgd	4.43	3.94	8.09	16.7	37.3	3.10	4.23	1.09	12.1	12.2	13.0	5.14
Cfs	6.85	6.10	12.5	25.8	57.7	4.80	6.54	1.69	18.7	18.9	20.1	7.95
Ac-ft	422	375	745	1590	3440	295	403	93	1150	1120	1240	473

Calendar Year 1964:	Max	69.2	Min	0.04	Mean mgd	12.8	Mean cfs	19.8	Ac-ft	14400
Fiscal Year 1964-65:	Max	69.2	Min	0.04	Mean mgd	10.1	Mean cfs	15.6	Ac-ft	11350

* Discharge measurement made on this day.
a No gage-height record.

6180. Kahakuloa Stream near Honokohau

Location.--Lat 20°58'54", long 156°33'26", on right bank 0.5 mile downstream from Kapuna Stream, 1.3 miles south of Kahakuloa, 2 miles west of Puu Makawana, and 4.3 miles southeast of Honokohau.

Drainage area.--3.47 sq mi.

Records available.--July 1939 to August 1943, September 1947 to June 1965. Records for January 1913 to December 1914 (fragmentary), at site 1 mile upstream not equivalent owing to difference in drainage areas.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 330 ft (from topographic map).

Average discharge.--20 years (1940-43, 1948-65), 10.9 mgd (16.9 cfs).

Extremes.--Maximum discharge during year, 1,820 mgd (2,820 cfs) May 2 (gage height, 8.48 ft), from rating curve extended above 110 mgd on basis of slope-area measurements at gage heights 6.70 and 8.48 ft; minimum, 3.02 mgd (4.67 cfs) July 10, 11.
1939-43, 1947-65: Maximum discharge, 1,990 mgd (3,080 cfs) Dec. 14, 1942 (gage height, 7.02 ft, control then in use), from rating curve extended above 55 mgd by test on model of station site; minimum, 1.95 mgd (3.02 cfs) Feb. 9-11, 1954.

Remarks.--Records fair except those for periods of no gage-height record, which are poor. No diversion above station.

Rating tables (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used May 12 to June 1)

July 1 to May 1

2.7	2.47	3.6	29.0
2.9	4.93	3.8	44.5
3.0	6.55	4.0	64.0
3.2	11.0	4.5	125
3.4	18.5	5.0	210

May 2 to June 30

2.8	4.40	3.7	36.0
2.9	5.90	4.0	64.0
3.1	10.0	4.5	138
3.4	19.6	5.0	260

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.98	3.98	3.47	3.72	96.9	4.66	4.66	4.93	5.25	7.15	19.4	35.8
2	4.39	4.52	3.36	3.85	18.9	4.93	4.52	30.0	24.0	6.55	*219	a9.0
3	4.39	3.85	3.36	4.80	29.2	4.66	4.80	162	61.8	6.23	21.3	a14
4	3.85	3.47	6.43	6.63	10.0	4.52	4.52	187	8.80	6.94	a9.5	a6.5
5	3.85	15.0	4.66	15.2	70.8	4.39	4.39	51.5	17.8	43.2	a8.5	a18
6	3.47	4.66	3.85	56.5	20.1	4.26	4.26	13.3	9.83	22.1	a13	a6.0
7	3.36	3.85	3.58	47.9	21.2	4.12	4.93	10.8	6.55	8.35	a8.0	a5.0
8	3.72	35.4	4.26	7.95	12.6	4.47	4.52	10.3	8.04	6.39	19.7	a4.9
9	3.25	7.33	9.20	5.74	17.3	14.5	4.26	13.4	7.68	12.3	13.8	a4.8
10	*3.02	4.93	8.05	5.58	9.04	9.69	4.26	13.8	6.63	11.2	8.24	*4.70
11	30.1	4.12	4.39	5.09	10.0	13.6	4.12	12.0	25.0	7.35	6.47	4.70
12	6.46	6.53	5.49	4.26	46.8	32.3	3.98	8.80	9.66	*5.98	5.75	5.00
13	4.12	11.5	4.39	3.98	9.04	13.6	4.40	7.75	6.75	10.2	5.60	4.85
14	3.58	5.25	9.59	5.43	7.55	12.1	9.51	7.45	14.7	29.9	5.30	4.70
15	4.12	4.26	7.28	11.9	6.23	6.91	4.66	9.53	20.8	7.75	14.9	4.85
16	4.12	7.77	20.4	35.2	5.58	35.7	4.39	11.3	8.15	6.95	6.82	4.85
17	3.47	5.71	26.0	7.30	5.25	21.4	3.98	11.7	6.55	6.55	5.30	4.70
18	3.36	8.73	20.0	23.3	9.57	6.39	3.85	6.75	6.06	6.55	5.00	4.70
19	5.94	4.52	5.90	66.3	102	35.7	3.85	7.95	5.90	18.6	4.85	6.35
20	12.1	3.85	5.25	58.9	31.4	17.0	3.72	6.95	5.90	17.9	5.00	7.66
21	5.09	3.58	6.08	46.8	11.0	13.9	12.7	6.23	5.74	6.95	5.00	6.09
22	13.4	3.72	5.63	21.5	7.75	11.9	13.8	6.75	13.7	6.39	4.70	7.32
23	43.2	3.58	4.26	9.28	6.55	16.0	62.4	6.55	24.9	6.39	4.55	6.09
24	29.9	3.36	3.85	7.15	5.90	6.06	10.6	*6.92	64.5	5.90	4.40	5.15
25	8.65	3.25	3.58	5.90	5.58	6.06	5.42	10.8	15.4	5.74	4.40	5.00
26	5.25	3.25	4.39	9.03	5.25	5.42	5.90	6.39	8.15	5.58	5.45	5.45
27	4.39	14.4	3.85	5.74	5.09	5.09	8.82	5.90	6.95	5.58	10.7	10.6
28	5.76	*9.19	9.81	5.42	4.93	4.93	6.20	5.42	6.55	26.4	5.00	6.09
29	6.16	5.29	8.95	5.09	4.80	4.80	9.72	---------	7.30	9.63	4.55	5.30
30	5.90	3.98	4.39	6.61	*4.66	6.75	5.74	---------	27.5	7.35	4.40	6.65
31	4.26	3.58	---------	10.8	---------	5.25	6.55	---------	10.7	---------	6.90	---------
Total	246.61	206.41	213.70	512.85	600.97	341.06	239.43	642.17	457.24	334.05	465.48	224.80
Mean												
Mgd	7.96	6.66	7.12	16.5	20.0	11.0	7.72	22.9	14.7	11.1	15.0	7.49
Cfs	12.3	10.3	11.0	25.5	30.9	17.0	11.9	35.4	22.7	17.2	23.2	11.6
Ac-ft	757	633	656	1,570	1,840	1,050	735	1,970	1,400	1,030	1,430	690

Calendar Year 1964:	Max	102	Min	3.02	Mean mgd	9.47	Mean cfs	14.7	Ac-ft	10,630
Fiscal Year 1964-65:	Max	219	Min	3.02	Mean mgd	12.3	Mean cfs	19.0	Ac-ft	13,760

Peak discharge (base, 400 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
12-16	1900	6.02	435	673	5-2	1330	8.48	1,820	2,820
2-4	0530	8.47	1,030	1,590					

* Discharge measurement made on this day.
a No gage-height record.

6200. Honokohau Stream near Honokohau

Location.--Lat 20°57'48", long 156°35'22", on right bank 1,000 ft upstream from intake of Honokohau ditch and 4.1 miles southeast of Honokohau.

Drainage area.--4.11 sq mi.

Records available.--September, November and December 1911 (combined flow of stream and ditch below point of diversion), March 1913 to September 1920, May 1922 to June 1965. Monthly discharge only for some periods, published in WSP 1319.

Gage.--Water-stage recorder and masonry control. Altitude of gage is 870 ft (from topographic map). Prior to Mar. 7, 1913, staff gage at site just below Honokohau ditch intake at different datum.

Average discharge.--50 years (1913-20, 1922-65), 26.0 mgd (40.2 cfs).

Extremes.--Maximum discharge during year, 1,440 mgd (2,230 cfs) May 1 (gage height, 6.94 ft), from rating curve extended above 120 mgd as explained below; minimum, 8.70 mgd (13.5 cfs) Sept. 2-4.
1911, 1913-20, 1922-65: Maximum discharge, 2,420 mgd (3,740 cfs) Dec. 14, 1942, Aug. 30, 1957 (gage height, 8.40 ft), from rating curve extended above 120 mgd by logarithmic plotting; minimum, 5.4 mgd (8.4 cfs) May 1, 1945, Jan. 5, 1946.

Remarks.--Records good. No diversion above station. All medium and low flow, together with the inflow from 2 development tunnels below station, is diverted into Honokohau ditch.

Rating table (gage height, in feet, and discharge, in million gallons a day)

1.9	6.70	3.0	75.0
2.0	9.20	3.5	147
2.3	20.3	4.0	250
2.6	38.0	4.5	395

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	13.8	20.6	9.20	10.1	283	15.5	13.4	12.7	12.0	11.7	94.9	74.6
2	19.4	18.8	8.95	12.4	52.9	22.3	13.0	40.5	81.4	12.0	208	22.7
3	15.3	10.8	8.70	15.9	69.8	15.3	13.0	166	174	11.7	42.9	32.4
4	21.5	9.82	18.5	16.0	28.3	14.2	12.7	153	*21.1	27.4	19.1	17.8
5	13.0	45.2	11.4	32.0	220	13.8	12.7	54.8	67.3	151	15.6	36.3
6	11.4	11.7	9.51	94.3	46.8	13.4	13.0	18.2	29.5	56.0	25.6	15.3
7	10.4	10.1	10.1	79.8	75.8	13.4	13.4	15.6	14.9	27.1	19.0	12.7
8	16.2	86.2	15.2	14.2	31.7	*19.3	13.4	14.5	15.3	22.4	16.1	12.3
9	10.4	16.6	32.4	11.4	48.9	42.2	12.7	13.8	14.2	77.1	20.2	12.0
10	10.1	11.4	20.5	21.8	28.2	19.0	12.3	15.3	13.4	32.9	14.5	11.7
11	43.9	14.6	13.4	11.4	53.9	26.1	12.3	17.3	16.2	16.4	13.4	11.7
12	21.9	30.8	16.0	9.82	92.7	88.2	12.0	13.8	13.4	13.4	13.0	14.9
13	11.7	21.3	10.4	9.20	34.5	70.7	30.9	13.0	13.8	14.3	13.0	12.3
14	11.4	11.7	11.4	23.9	16.9	41.8	23.7	13.0	19.9	50.6	12.7	11.7
15	28.2	10.8	11.1	32.6	14.9	17.3	15.3	13.8	34.1	13.4	21.7	15.3
16	12.7	28.0	68.5	57.9	14.5	64.1	21.2	19.1	14.5	12.7	13.8	13.0
17	10.4	33.5	50.5	14.8	14.2	34.0	12.7	21.0	13.0	12.3	12.7	11.7
18	10.4	20.8	45.1	15.9	14.5	15.3	12.0	16.1	12.3	12.3	12.3	12.7
19	21.9	10.8	12.3	37.2	103	66.2	11.7	24.3	12.3	13.0	12.3	25.3
20	27.1	10.1	13.3	51.6	29.3	53.7	11.7	16.4	12.0	12.7	13.0	26.2
21	17.3	9.82	30.4	71.0	40.8	52.5	23.6	13.8	12.0	11.7	12.7	14.3
22	*31.4	10.1	15.5	30.1	18.6	40.0	25.7	18.2	16.6	11.7	12.0	29.4
23	62.3	10.4	9.82	18.7	16.4	43.4	145	14.9	31.3	11.7	12.0	15.3
24	44.8	9.51	9.20	15.3	15.3	14.9	25.0	20.7	133	11.7	11.7	11.7
25	13.0	9.20	9.20	17.7	14.5	14.5	15.2	23.7	21.9	11.4	17.1	11.4
26	11.1	9.20	9.51	38.6	14.2	14.2	16.8	18.1	13.8	11.4	21.3	14.2
27	10.4	10.1	9.20	12.7	14.2	14.2	*21.2	14.5	12.7	11.4	29.6	24.5
28	16.5	12.6	30.6	17.1	14.2	14.2	13.4	12.3	12.3	60.4	13.4	*26.6
29	14.8	10.1	22.4	*12.3	13.8	13.0	20.2	---------	12.3	18.6	14.7	12.3
30	14.0	9.20	17.5	11.7	13.8	43.0	17.9	---------	13.4	14.5	13.8	32.3
31	10.4	9.20	---------	44.7	---------	14.9	21.0	---------	12.0	---------	23.0	---------
Total	587.1	543.05	559.79	862.12	1449.6	944.6	638.1	808.4	895.9	774.9	795.1	594.6
Mean												
Mgd	18.9	17.5	18.7	27.8	48.3	30.5	20.6	28.9	28.9	25.8	25.6	19.8
Cfs	29.2	27.1	28.9	43.0	74.7	47.2	31.9	44.7	44.7	39.9	39.6	30.6
Ac-ft	1800	1670	1720	2650	4450	2900	1960	2480	2750	2380	2440	1820

Calendar Year 1964:	Max	300	Min	8.20	Mean mgd	24.6	Mean cfs	38.1	Ac-ft	27,600
Fiscal Year 1964-65:	Max	283	Min	8.70	Mean mgd	25.9	Mean cfs	40.1	Ac-ft	29,020

* Discharge measurement made on this day.

Peak discharge (base, 700 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
12-16	2000	5.91	934	1,450	5-1	1730	6.94	1,440	2,230
4- 5	0500	5.81	890	1,380					

6290. Honokowai ditch near Lahaina

Location.--Lat 20°55'57", long 156°37'31", on left bank just downstream from intake on Kapaloa Stream and 5.4 miles northeast of Lahaina lighthouse.

Records available.--July 1912 to December 1917, November 1918 to January 1958, June 1958 to June 1965. Monthly discharge only January 1916, published in WSP 1319.

Gage.--Water-stage recorder. Altitude of gage is 1,600 ft (from topographic map). Prior to Jan. 1, 1918, staff gage at site 0.5 mile downstream, Nov. 14, 1918, to May 27, 1921, water-stage recorder at site 1.5 miles downstream, and May 28, 1921, to Apr. 21, 1951, water-stage recorder in tunnel section now abandoned 75 ft downstream from Kapaloa Stream intake, all at different datums.

Average discharge.--49 years (1912-16, 1919-57, 1958-65), 5.80 mgd (8.97 cfs).

Extremes.--1912-65: Maximum daily discharge, 43 mgd (66 cfs) June 30, 1930; no flow at times.

Remarks.--Records fair. Ditch diverts from Amalu and Kapaloa Streams just above station for irrigation of sugarcane and domestic use.

Cooperation.--Records of daily discharge since July 1932 furnished by Pioneer Mill Co.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.51	7.63	3.39	3.98	30.7	3.15	3.75	3.70	3.60	3.63	7.10	16.5
2	3.51	6.55	3.39	4.25	13.4	6.60	3.63	5.70	11.6	3.63	3.10	8.27
3	3.51	3.81	3.39	5.74	12.6	3.22	3.63	19.5	21.2	3.63	5.97	8.24
4	3.51	3.45	3.59	4.47	8.74	3.08	3.73	13.2	5.98	3.63	4.76	6.51
5	3.51	12.6	3.98	8.12	26.7	3.04	3.20	11.1	12.3	16.8	3.99	12.2
6	3.51	4.30	3.75	20.3	13.2	3.04	3.15	5.22	10.8	13.7	4.53	5.03
7	3.15	3.54	3.75	16.2	19.5	2.97	3.15	4.83	4.36	10.5	*5.54	4.26
8	4.60	17.3	4.53	4.37	10.4	3.02	3.98	4.14	4.07	6.74	5.15	3.86
9	3.19	5.05	9.80	4.10	13.2	10.5	3.39	3.81	4.09	24.7	5.60	3.75
10	3.15	3.60	6.34	6.49	10.0	4.98	3.15	3.89	3.99	8.61	4.76	3.75
11	7.52	3.74	4.60	4.51	15.2	4.87	3.15	4.62	3.99	5.79	3.52	3.75
12	6.51	7.78	5.33	3.63	15.7	17.5	3.15	3.84	3.87	4.69	3.39	4.22
13	4.13	5.62	3.90	3.51	9.36	17.5	9.47	3.63	3.87	4.79	3.90	4.43
14	3.60	3.77	3.75	6.95	4.44	11.5	7.21	3.63	4.25	13.2	4.11	4.14
15	9.59	3.56	3.61	10.7	4.07	4.04	4.56	3.56	5.99	5.05	4.61	5.15
16	3.97	8.84	16.5	13.1	3.99	8.27	7.67	3.64	4.04	4.71	4.29	4.89
17	3.44	12.0	13.3	5.09	3.87	8.28	3.72	5.56	3.69	4.35	4.05	4.22
18	3.39	6.19	17.0	3.75	3.87	4.04	3.30	4.09	3.51	4.35	3.55	4.39
19	5.87	3.79	4.74	4.87	14.4	9.71	3.15	6.79	3.51	4.21	3.59	8.13
20	8.25	3.39	5.19	8.17	7.28	11.9	3.15	4.94	3.51	4.11	3.87	7.21
21	5.64	3.39	6.46	12.4	12.5	10.1	4.17	4.22	3.51	4.11	3.87	5.09
22	5.23	3.39	6.19	6.00	5.37	6.25	5.50	4.99	3.45	4.11	3.87	9.58
23	16.1	3.39	3.70	5.40	3.99	8.76	17.6	4.20	6.88	4.11	3.87	4.81
24	8.29	3.15	3.51	4.74	3.99	4.01	6.47	5.72	20.3	4.11	3.87	4.16
25	4.30	3.27	3.51	5.89	3.99	3.75	3.71	6.85	6.49	4.11	3.87	3.99
26	3.43	3.27	3.51	15.9	3.99	3.75	3.87	4.37	4.60	3.93	5.78	4.04
27	3.15	3.27	3.51	4.65	3.80	3.75	4.94	4.43	4.35	3.75	8.22	6.86
28	4.69	3.27	8.88	6.59	3.69	3.46	3.93	3.85	4.17	12.7	4.35	10.4
29	4.21	3.27	7.29	4.35	3.51	3.39	4.58	---------	3.85	6.04	4.30	4.41
30	4.42	3.27	5.25	3.75	3.26	11.8	5.01	---------	3.63	4.72	5.01	11.1
31	3.36	3.34	---------	11.9	---------	4.29	6.07	---------	3.63	---------	6.65	---------
Total	154.24	162.79	175.64	223.87	288.71	204.52	149.14	158.02	187.08	202.51	143.04	187.34
Mean												
Mgd	4.98	5.25	5.85	7.22	9.62	6.60	4.81	5.64	6.03	6.75	4.61	6.24
Cfs	7.71	8.12	9.05	11.2	14.9	10.2	7.44	8.73	9.33	10.4	7.13	9.65
Ac-ft	473	500	539	687	886	628	458	485	574	621	439	575

Calendar Year 1964:	Max	30.7	Min	2.31	Mean mgd	6.02	Mean cfs	9.62	Ac-ft	6760		
Fiscal Year 1964-65:	Max	30.7	Min	2.97	Mean mgd	6.13	Mean cfs	9.48	Ac-ft	6860		

* Discharge measurement made on this day.

6385. Kahoma Stream at Lahaina

Location.--Lat 20°53'10", long 156°40'36", on right bank 0.2 mile west of Kelawea, 0.6 mile northeast of Lahaina, 0.6 mile downstream from Kanaha Stream, and 0.9 mile upstream from mouth.

Drainage area.--5.22 sq mi.

Records available.--October 1962 to June 1965.

Gage.--Water-stage recorder. Altitude of gage is 90 ft (from topographic map).

Extremes.--Maximum discharge during year, 542 mgd (839 cfs) July 23 (gage height, 7.58 ft), from rating curve extended above 16 mgd on basis of slope-area measurements at gage heights 5.28, 6.01, and 7.58 ft; no flow most of the time.
1962-65: Maximum discharge, that of July 23, 1964; no flow most of the time each year.
Maximum discharge known, 5,010 mgd (7,750 cfs) May 13, 1960, by slope-area measurement of peak flow at site 0.5 mile upstream.

Remarks.--Records fair except those for period of no gage-height record, which are poor. Diversion above station by Pioneer Mill Co. for irrigation of sugarcane. Diversion from Kanaha Stream above station by Maui County Board of Water Supply for domestic use. Continuous records of rainfall are obtained at station.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0	0		0	19.9	0	0.08	0	0	*0	13	0.08
2	0	0		0	2.76	0	0	0	0	0	1.7	.02
3	0	0		0	.09	0	0	2.16	5.75	0	.2	0
4	0	0		0	.77	0	0	*1.39	0	0	.02	0
5	0	1.35		0	41.7	0	0	3.89	0	10.4	0	0
6	0	.03		0	16.9	0	0	.51	0	4.99	0	0
7	0	0		0	28.4	0	0	1.09	0	1.68	0	*0
8	0	0		0	6.50	0	.86	.37	0	.18	0	0
9	0	0		*0	8.07	0	0	0	0	2.09	0	0
10	0	0		0	2.11	.08	0	0	0	.20	0	0
11	*0	0		0	2.90	0	0	.02	0	.03	0	0
12	0	.21		0	3.89	3.24	0	0	0	0	0	0
13	0	0		0	.30	7.23	8.95	0	0	0	0	0
14	0	0		0	.05	1.97	3.31	0	0	3.72	0	0
15	.31	0		0	.02	.27	.93	0	0	0	0	0
16	0	1.46		0	.02	21.7	3.90	0	0	0	0	0
17	0	.24		0	.02	7.89	.59	0	0	0	0	0
18	0	.82		0	.01	1.63	.02	0	0	0	0	0
19	0	0		0	.01	14.6	*0	0	0	0	0	0
20	0	0		0	.58	8.85	2.29	0	0	0	0	0
21	0	0		0	3.24	5.21	2.92	0	0	0	0	0
22	0	0		0	.24	3.94	1.98	0	.03	0	0	0
23	*12.7	0		0	.07	7.67	14.4	0	.08	0	0	0
24	.10	0		0	.12	1.00	3.24	0	.71	0	0	0
25	0	0		0	*.06	.47	.30	*0	0	0	0	0
26	0	0		.06	.03	.78	0	0	0	0	0	0
27	0	0		0	.02	.49	0	0	0	0	0	0
28	*0	0		0	.01	.11	0	0	0	.02	0	0
29	0	0		0	.01	.08	0	---------	0	0	0	0
30	0	0		0	0	*3.91	0	---------	0	0	0	0
31	0	*0	---------	0	---------	.68	0	---------	0	---------	0	---------
Total	13.11	4.11	0	0.06	138.80	91.80	43.77	9.43	6.57	23.31	14.92	0.10
Mean												
Mgd	0.423	0.133	0	0.002	4.63	2.96	1.41	0.337	0.212	0.777	0.481	0.003
Cfs	0.654	0.206	0	0.003	7.16	4.58	2.18	0.521	0.328	1.20	0.744	0.005
Ac-ft	40	13	0	0.2	426	282	134	29	20	72	46	0.3

Calendar Year 1964: Max 41.7 Min 0 Mean mgd 0.822 Mean cfs 1.27 Ac-ft 924
Fiscal Year 1964-65: Max 41.7 Min 0 Mean mgd 0.948 Mean cfs 1.47 Ac-ft 1,060

Peak discharge (base, 250 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-23	1530	7.58	542	839	5-1	-	5.97	310	480
12-16	2000	6.60	405	627					

* Discharge measurement or observation of no flow made on this day.

Note.--No gage-height record Apr. 17 to June 6.

6450. Olowalu ditch near Olowalu

Location.--Lat 20°49'33", long 156°36'47", on left bank 1.2 miles northeast of Olowalu and 5.5 miles southeast of Lahaina.

Records available.--August 1911 to January 1916, April 1916 to September 1920, November 1920 to January 1958, June 1958 to June 1965. Prior to July 1913, published as Olowalu ditch 1 near Olowalu. Monthly discharge only for June 1932, published in WSP 1319.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 480 ft (from topographic map). Prior to June 30, 1916, staff gage in tailrace of powerhouse 1,000 ft downstream at different datum. July 28, 1916, to June 8, 1919, staff gage, and June 9, 1919, to June 30, 1932, water-stage recorder, at site 300 ft upstream at different datum. July 1, 1932, to Oct. 7, 1933, records obtained by combining flows at three stations about 1,000 ft downstream.

Average discharge.--49 years (1912-15, 1917-20, 1921-57, 1958-65), 4.84 mgd (7.49 cfs).

Extremes.--1911-65: Maximum daily discharge, 13.7 mgd (21.2 cfs) Apr. 17, 1935; no flow at times.

Remarks.--Records good. Ditch diverts from Olowalu Stream at altitude 520 ft for irrigation of sugarcane and domestic use in the Olowalu area.

Cooperation.--Records of daily discharge since July 1932 furnished by Pioneer Mill Co.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.36	2.76	2.25	2.86	8.72	5.56	6.90	6.54	4.32	3.41	6.44	7.74
2	3.87	2.94	2.16	2.73	8.83	5.28	6.73	6.26	5.96	3.28	8.27	7.77
3	3.59	2.53	2.11	2.92	8.54	5.04	6.52	7.11	11.0	3.35	7.91	5.29
4	3.69	*2.32	2.27	2.75	8.21	4.79	5.79	7.56	10.7	3.88	7.84	4.85
5	3.31	5.02	2.21	4.39	8.60	4.60	6.33	8.14	9.97	10.6	6.01	5.49
6	2.93	3.58	2.12	8.91	6.38	4.39	7.04	8.31	9.52	10.4	5.46	4.51
7	2.80	2.76	2.15	8.89	5.88	4.29	6.62	8.09	7.47	10.1	*5.01	3.94
8	3.09	5.93	2.29	7.33	5.55	4.25	7.32	7.86	6.60	7.34	4.53	3.63
9	2.66	4.55	2.76	5.02	5.65	6.05	6.90	7.42	6.06	10.3	4.32	3.46
10	2.56	3.59	3.01	4.81	5.30	8.53	6.47	6.38	5.58	8.89	4.14	3.23
11	4.54	3.33	2.52	3.89	5.30	7.71	6.17	5.17	5.56	6.82	3.94	3.12
12	4.48	5.54	2.45	3.46	5.54	8.26	6.05	4.71	5.27	5.90	3.82	3.17
13	3.48	4.87	2.29	3.15	5.13	8.79	6.99	4.45	5.17	5.77	4.07	2.94
14	3.11	3.91	2.10	3.46	4.91	8.72	7.41	4.32	5.10	9.33	3.77	2.96
15	4.40	3.53	2.00	5.42	4.76	8.10	7.21	4.89	5.02	6.62	7.91	3.07
16	3.60	4.17	6.15	6.68	4.70	7.85	7.58	4.17	4.56	5.67	5.36	2.89
17	3.06	5.06	7.19	5.41	4.66	9.00	7.22	3.77	4.29	5.20	4.43	2.67
18	2.82	5.29	9.03	4.08	4.58	8.92	6.94	3.69	4.10	4.98	4.13	2.94
19	3.45	4.13	5.96	3.60	4.93	8.31	6.75	3.85	4.09	4.71	3.91	4.08
20	4.35	3.58	4.20	4.15	5.27	7.76	6.62	3.64	4.09	4.44	3.80	3.30
21	4.09	3.21	3.83	8.47	6.17	7.86	6.59	3.42	4.09	4.24	3.63	2.92
22	3.67	3.12	3.50	8.18	5.43	7.91	6.42	4.19	4.09	4.18	3.49	3.71
23	6.85	2.95	3.11	5.92	5.39	7.81	6.93	3.95	4.02	4.05	3.38	3.22
24	6.87	2.69	2.88	4.87	5.14	7.45	7.31	4.52	6.42	3.91	3.24	2.92
25	5.10	2.61	2.73	4.42	4.96	7.23	7.25	4.99	4.28	3.78	3.43	2.70
26	3.77	2.47	2.61	8.03	4.88	7.20	7.30	4.07	3.87	3.66	3.62	2.94
27	3.45	2.47	2.55	5.21	4.82	7.22	7.07	4.55	3.80	3.54	4.51	3.82
28	3.33	2.49	3.74	5.08	5.53	7.17	6.90	4.55	3.79	6.96	3.42	4.24
29	3.05	2.36	3.12	4.43	6.21	7.05	6.83	---------	3.65	5.35	3.25	3.51
30	2.77	2.25	2.65	3.87	5.86	7.10	6.78	---------	3.55	4.14	3.13	4.35
31	2.54	2.22	---------	4.52	---------	6.99	6.79	---------	3.40	---------	3.74	---------
Total	114.64	108.23	97.94	156.91	175.83	217.19	211.73	150.57	169.39	174.80	143.91	115.38
Mean												
Mgd	3.70	3.49	3.26	5.06	5.86	7.01	6.83	5.38	5.46	5.83	4.64	3.85
Cfs	5.72	5.40	5.04	7.83	9.07	10.8	10.6	8.32	8.45	9.02	7.18	5.96
Ac-ft	352	332	301	482	540	666	650	462	520	536	442	354

Calendar Year 1964:	Max	9.03	Min	2.00	Mean mgd	4.45	Mean cfs	6.89	Ac-ft	5,000		
Fiscal Year 1964-65:	Max	11.0	Min	2.00	Mean mgd	5.03	Mean cfs	7.78	Ac-ft	5,640		

* Discharge measurement made on this day.

6462. Olowalu Stream at Olowalu

Location.--Lat 20°49'23", long 156°37'15", on downstream side of center pier of plantation road bridge, 0.6 mile northeast of Olowalu, and 5.5 miles southeast of Lahaina.

Drainage area.--4.08 sq mi.

Records available.--May 1963 to June 1965.

Gage.--Water-stage recorder. Altitude of gage is 130 ft (from topographic map).

Extremes.--1963: Maximum discharge during period May to June, 154 mgd (238 cfs) May 17 (gage height, 3.20 ft), from rating curve extended above 16 mgd as explained below; no flow most of the time.

1963-64: Maximum discharge during fiscal year, 247 mgd (382 cfs) July 20 (gage height, 3.46 ft), from rating curve extended above 16 mgd as explained below; no flow most of the time.

1964-65: Maximum discharge during fiscal year, 375 mgd (580 cfs) Nov. 5 (gage height, 3.73 ft), from rating curve extended above 30 mgd on basis of slope-area measurements at gage heights 3.39 and 3.58 ft; no flow most of the time.

Remarks.--Records fair. All low flow diverted 1.5 miles above station by Olowalu ditch (see preceding page) for domestic use and irrigation of sugarcane in vicinity of Olowalu. Continuous records of rainfall are obtained at station.

Rating tables (gage height, in feet, and discharge, in million gallons a day)

May 10, 1963, to July 22, 1964				July 23, 1964, to June 30, 1965			
1.25	0	2.0	5.70	1.03	0	1.7	3.65
1.3	.03	2.1	8.50	1.1	.11	1.8	5.35
1.4	.19	2.3	16.2	1.2	.28	2.0	10.5
1.5	.45	2.4	22.3	1.3	.53	2.2	18.7
1.6	.86	2.6	39.0	1.4	.91	2.5	40.0
1.7	1.53	2.8	66.0	1.5	1.47	2.8	73.0
1.8	2.50			1.6	2.40		

Discharge, in million gallons a day, May to June 1963

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1											-	0
2											-	0
3											-	0
4											-	0
5											-	0
6											-	0
7											-	0
8											-	0
9											-	0
10											*0.08	0
11											9.76	0
12											1.44	0
13											5.13	0
14											10.8	0
15											11.5	0
16											3.21	0
17											58.1	0
18											47.3	.27
19											14.7	0
20											12.2	0
21											4.95	0
22											1.30	0
23											0	0
24											0	a0
25											0	a0
26											0	a0
27											0	a0
28											0	a0
29								---------			0	a0
30								---------			0	a0
31			----------		----------			---------		----------	0	----------
Total											-	0.27
Mean												
Mgd											-	0.009
Cfs											-	0.014
Ac-ft											-	0.8

Calendar Year	Max		Min		Mean mgd		Mean cfs		Ac-ft		
Fiscal Year 1962-63:	Max	-	Min	-	Mean mgd	-	Mean cfs	-	Ac-ft	-	

Peak discharge (base, 220 mgd).--No peak above base.

* Observation of no flow made on this day.
a No gage-height record.

6462. Olowalu Stream at Olowalu--Continued

Discharge, in million gallons a day, fiscal year July 1963 to June 1964

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	a3.0	0	0	0	0		0	0		0	0	
2	*a2.0	0	0	0	0		0	0		0	0	
3	0	0	0	0	0		.35	0		0	0	
4	.05	0	0	0	0		0	0		0	0	
5	.43	0	0	0	0		0	0		0	0	
6	0	*0	0	0	0		0	0		0	0	
7	0	0	0	0	0		0	0		0	0	
8	0	0	0	5.75	3.79		*0	0		0	0	
9	0	0	0	2.09	3.30		.08	0		0	0	
10	0	0	0	0	7.03		0	0		0	0	
11	0	0	0	0	.59	(*)	0	0	(*)	0	0	
12	0	0	0	0	0.00		0	0		0	0	
13	0	0	0	0	0		0	0		0	0	
14	0	0	0	0	0		0	0		0	0	
15	0	0	0	0	0		0	0		0	0	
16	0	0	0	0	.08		.01	0		0	0	
17	0	0	*28.9	0	0		0	0		0	0	
18	0	0	4.00	0	0		0	0		0	0	
19	.84	0	0	0	0		0	0		0	0	
20	39.4	0	0	29.3	0		0	0		0	3.30	
21	.29	0	0	4.08	0		0	0		*0	4.84	
22	.01	0	0	0	0		*0	1.03		0	0	
23	0	0	0	0	0		0	.34		0	1.36	
24	0	.29	0	.01	0		0	3.51		**2.32	*2.03	
25	0	0	0	0	0		0	0		4.52	55.6	
26	0	0	0	0	0		0	0		.55	11.6	
27	8.85	0	0	0	0		0	0		0	.23	
28	.06	0	0	0	0		0	0		1.71	*0	
29	0	0	0	0	0		0	0		.67	0	
30	0	0	0	0	0		0	---------		0	0	
31	0	0	----------	*0	----------		0	---------	(*)	----------	0	----------
Total	54.93	0.29	32.90	41.23	14.79	0	0.44	4.88	0	9.77	78.96	0
Mean												
Mgd	1.77	0.009	1.10	1.33	0.493	0	0.014	0.168	0	0.326	2.55	0
Cfs	2.74	0.014	1.70	2.06	0.763	0	0.022	0.260	0	0.504	3.95	0
Ac-ft	169	0.9	101	127	45	0	1.4	15	0	30	242	0

Calendar Year 1963: Max - Min - Mean mgd - Mean cfs - Ac-ft -
Fiscal Year 1963-64: Max 55.6 Min 0 Mean mgd 0.651 Mean cfs 1.01 Ac-ft 731

Peak discharge (base, 220 mgd)

Date	Time	Gage height	Discharge	
			Mgd	Cfs
7-20	0100	3.46	247	382

* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
a No gage-height record.

6462. Olowalu Stream at Olowalu--Continued

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0		0	0	53.4	0	0	0	0	0	1.34	0.03
2	0		0	0	14.2	0	0	0	1.06	0	.08	.09
3	0		0	0	2.27	0	0	3.58	20.8	0	0	0
4	0		0	0	1.53	0	0	6.24	1.95	0	0	0
5	0		0	0	67.6	0	0	18.9	.20	4.65	0	0
6	0		0	.03	38.8	0	.47	8.19	.47	2.12	0	0
7	0		0	0	35.6	0	.28	5.17	0	0	0	*0
8	0		0	0	15.4	0	3.91	3.38	0	*0	0	0
9	0		0	*0	19.3	.24	.50	3.67	0	0	0	0
10	0		0	0	7.35	.14	0	3.44	0	0	0	0
11	*.01		0	0	5.48	0	0	1.56	0	0	0	0
12	0		0	0	11.2	0	0	.38	0	0	0	0
13	0		0	0	3.55	0	20.6	0	0	0	0	0
14	0		0	0	1.15	0	17.6	0	0	.20	0	0
15	0		0	0	1.16	0	13.1	.03	0	0	0	0
16	0		.44	0	.43	12.2	30.3	0	0	0	0	0
17	0		.08	0	0	23.2	10.6	0	0	0	0	0
18	0		.14	0	0	6.18	4.30	0	0	0	0	0
19	0		0	0	.54	30.6	*1.82	0	0	0	0	0
20	0		0	0	6.66	56.7	1.01	0	0	0	0	0
21	0		0	0	32.2	*33.8	.66	0	0	0	0	0
22	0		0	0	13.0	24.1	.29	0	0	0	0	0
23	*14.3		0	0	11.2	23.9	7.83	0	0	0	0	0
24	*1.96		0	0	4.61	8.73	5.80	0	.64	0	0	0
25	0		0	0	*2.52	4.12	1.87	*0	0	0	0	0
26	0		0	0	3.25	2.10	.88	0	0	0	0	0
27	0		0	0	2.75	1.16	.25	0	0	0	0	0
28	0		0	0	1.59	.69	0	0	0	.03	0	0
29	0		0	0	.24	.02	0	---------	0	0	0	0
30	0		0	0	0	1.13	0	---------	0	0	0	0
31	0	(*)	----------	0	----------	.28	0	---------	0	----------	0	----------
Total	16.27	0	0.66	0.03	356.98	229.29	122.07	54.54	25.12	7.00	1.42	0.12
Mean												
Mgd	0.525	0	0.022	0.001	11.9	7.40	3.94	1.95	0.810	0.233	0.046	0.004
Cfs	0.812	0	0.034	0.002	18.4	11.4	6.10	3.02	1.25	0.361	0.071	0.006
Ac-ft	50	0	2.0	0.1	1100	704	375	167	77	21	4.4	0.4

Calendar Year 1964: Max 67.6 Min 0 Mean mgd 1.91 Mean cfs 2.96 Ac-ft 2140
Fiscal Year 1964-65: Max 67.6 Min 0 Mean mgd 2.23 Mean cfs 3.45 Ac-ft 2500

* Discharge measurement or observation of no flow made on this day.

Peak discharge (base, 220 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-23	1400	3.57	296	458	12-16	2030	3.60	310	480
11- 5	2030	3.73	375	580					

6600. Kulanihakoi Gulch near Kihei

Location.--Lat 20°46'06", long 156°27'03", on right bank 0.5 mile northeast of Lihue Cemetery, 0.8 mile upstream from mouth, and 1.3 miles southeast of Kihei.

Drainage area.--14.4 sq mi.

Records available.--October 1962 to June 1965.

Gage.--Water-stage recorder. Altitude of gage is 35 ft (from topographic map).

Extremes.--Maximum discharge during year, 37.8 mgd (58.5 cfs) May 10 (gage height, 2.47 ft); no flow most of the time.
1962-65: Maximum discharge, 290 mgd (449 cfs) Jan. 16, 1963 (gage height, 4.02 ft), from rating curve extended above 52 mgd on basis of slope-area measurement of peak flow; no flow at times each year.

Remarks.--Records fair. No diversion above station. Continuous records of rainfall are obtained at station.

Rating table (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used Dec. 21, 22, Feb. 5, May 10, 11)

0.92	0	1.2	0.50
1.0	.04	1.3	.91
1.1	.20	1.4	1.50

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1						0		0			0	
2						0		0			0	
3			(*)			0		0			0	
4						0		0			0	
5						0		.10			0	
6						0		0			0	
7						*0		0			0	
8						0		0			0	
9						0		*0		(*)	0	
10						0		0			1.42	
11						0		0			.12	
12						0		0			0	
13						0		0			0	
14						0		0			0	
15						0		0			0	
16						0		0			0	
17						0		0			*0	
18						0		0			0	
19						0		0			0	
20				(*)		0		0			0	
21	(*)					.57		0			0	
22						*.42	(*)	*0			0	(*)
23						0		0			0	
24						0		0			0	
25						0		0			0	
26						0		0			0	
27						0		0			0	
28						0		0			0	
29						0		---			0	
30						0		---			0	
31			---		---	0		---		---	0	---
Total	0	0	0	0	0	0.99	0	0.10	0	0	1.54	0
Mean												
Mgd	0	0	0	0	0	0.032	0	0.004	0	0	0.050	0
Cfs	0	0	0	0	0	0.050	0	0.006	0	0	0.077	0
Ac-ft	0	0	0	0	0	3.0	0	0.3	0	0	4.7	0

Calendar Year 1964:	Max	0.57	Min	0	Mean mgd	0.003	Mean cfs	0.005	Ac-ft	3.6
Fiscal Year 1964-65:	Max	1.42	Min	0	Mean mgd	0.007	Mean cfs	0.011	Ac-ft	8.0

Peak discharge (base, 40 mgd).--No peak above base.

* Discharge measurement or observation of no flow made on this day.

7000. Waiakea Stream near Mountain View

Location.--Lat 19°38'30", long 155°10'30", on left bank 450 ft upstream from Olaa Flume Road and 7.5 miles northwest of Mountain View.

Drainage area.--Not determined.

Records available.--September 1930 to June 1965. Prior to July 1962, published as "at middle flume house, near Mountain View." See also Note below.

Gage.--Water-stage recorder and combined Parshall flume and concrete-weir control. Datum of gage is 1,934 ft above mean sea level (by stadia survey).

Average discharge.--34 years (1931-65), 7.56 mgd (11.7 cfs).

Extremes.--Maximum discharge during year, 128 mgd (198 cfs) Nov. 7 (gage height, 3.81 ft); minimum, 1.00 mgd (1.55 cfs) Mar. 2.
1930-65: Maximum discharge, 365 mgd (565 cfs), Mar. 14, 1942 (gage height, 4.43 ft), from rating curve extended above 110 mgd by logarithmic plotting; no flow at times.

Remarks.--Records good. No diversion above station. Large part of flow comes from 3 tunnels.

Note.--Published records for peaks in fiscal years 1939, 1942, 1944, 1945, 1947, 1949-53, 1955-58, 1960 have been found to be in error; revised records are on file in the district office and will be published in the next water-supply paper.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.3	0.80	1.3	7.60
.4	1.20	2.2	18.3
.7	2.90	3.1	45.0

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	6.34	4.39	5.16	7.33	10.5	4.13	2.36	*3.38	*1.08	3.64	7.24	*4.57
2	6.34	12.8	6.34	7.24	9.93	3.92	2.78	3.20	5.50	3.50	5.80	6.07
3	6.16	10.3	5.72	7.24	10.0	3.71	3.78	3.08	20.7	3.44	10.7	5.64
4	6.07	9.82	5.56	6.79	12.0	3.50	3.64	3.14	17.2	3.38	19.6	5.72
5	5.64	9.40	5.72	6.61	13.7	3.26	3.14	2.90	14.8	10.3	15.6	7.22
6	5.24	8.90	5.40	6.34	20.6	3.08	3.02	2.78	15.3	18.8	15.6	7.42
7	4.92	8.30	5.40	6.97	27.2	3.02	2.78	2.66	14.3	19.4	19.0	6.61
8	4.68	8.40	5.08	6.25	37.0	3.32	2.60	3.02	13.6	22.5	18.0	6.16
9	4.36	8.60	6.97	5.98	39.5	4.08	2.48	2.66	12.9	23.9	20.7	5.64
10	4.13	8.00	6.70	5.72	42.6	3.08	2.42	2.48	12.0	23.0	22.2	5.32
11	4.20	7.60	6.61	5.32	42.2	3.75	2.24	2.42	11.6	19.6	19.8	5.24
12	4.60	8.10	6.88	5.00	38.6	7.64	2.12	2.36	11.1	17.8	17.7	5.64
13	4.20	8.60	6.88	4.68	33.8	6.07	2.00	2.24	10.5	16.1	16.0	5.32
14	3.99	8.10	6.97	4.44	29.0	6.34	1.88	3.29	9.71	14.1	14.1	4.92
15	4.92	7.70	6.88	4.36	22.5	5.98	1.82	2.36	9.00	12.7	12.6	4.76
16	4.28	7.33	11.0	4.20	18.3	5.48	1.65	2.24	8.20	11.8	11.6	4.68
17	4.20	6.79	10.2	4.52	16.7	6.07	1.55	2.06	7.33	11.0	10.8	4.44
18	3.92	6.61	11.4	4.44	14.5	5.32	1.40	1.82	6.70	10.4	9.82	4.13
19	3.92	6.16	10.7	4.52	12.8	4.84	1.30	1.70	6.16	10.0	9.00	4.06
20	3.92	5.98	10.4	9.22	11.6	4.44	1.20	1.82	5.72	10.4	8.80	5.96
21	3.64	5.72	9.93	12.5	10.8	3.99	1.16	1.70	5.24	9.10	7.70	6.07
22	3.50	5.32	9.30	12.6	9.93	3.78	1.16	1.60	5.32	8.30	6.97	5.56
23	5.74	5.00	8.50	12.2	9.00	3.57	12.8	1.45	5.16	7.51	6.43	5.24
24	5.24	4.68	7.90	11.7	8.10	3.20	8.10	1.40	4.76	6.97	6.25	5.00
25	4.44	4.36	7.24	11.9	7.24	3.08	6.79	1.30	4.68	6.43	6.16	4.92
26	4.13	4.13	6.79	11.7	6.61	2.90	5.98	1.25	4.13	5.89	7.06	4.84
27	3.92	5.29	6.34	13.1	6.07	2.78	4.84	1.16	3.92	5.32	6.43	4.68
28	3.64	5.56	6.25	11.9	5.56	2.66	4.44	1.08	3.78	4.92	5.89	4.52
29	3.44	5.16	7.06	11.6	5.08	2.54	4.13	---------	3.64	4.52	5.40	4.36
30	3.64	5.08	*7.09	*11.1	*4.52	2.42	3.92	---------	3.64	*4.44	5.00	*4.13
31	*4.13	*5.00	---------	11.1	---------	*2.33	3.64	---------	*3.71	---------	4.68	---------
Total	141.49	217.18	222.37	248.57	535.94	124.28	103.12	62.55	261.38	329.16	352.63	158.84
Mean												
Mgd	4.56	7.01	7.41	8.02	17.9	4.01	3.33	2.23	8.43	11.0	11.4	5.29
Cfs	7.06	10.8	11.5	12.4	27.7	6.20	5.15	3.45	13.0	17.0	17.6	8.18
Ac-ft	434	667	682	763	1,640	381	316	192	802	1,010	1,080	487

Calendar Year 1964:	Max	72.5	Min	0.77	Mean mgd	113	Mean cfs	17.5	Ac-ft	12,740
Fiscal Year 1964-65:	Max	42.6	Min	1.08	Mean mgd	7.55	Mean cfs	11.7	Ac-ft	8,450

* Discharge measurement made on this day.

Peak discharge (base, 50 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
11- 7	0100	3.81	128	198	4-6	0900	3.55	78.5	121
11- 9	1430	3.28	52.2	80.8	5-3	2330	3.28	52.2	80.8
1-23	1730	3.44	64.4	99.6	5-9	1700	3.68	99.6	154
3- 3	1100	3.33	55.1	85.3					

7012. Waiakea Stream near Hilo

Location.--Lat 19°41'35", long 155°05'55", on right bank 2.5 miles south of Hilo Post Office and 3.0 miles southeast of Piihonua.

Drainage area.--97 sq mi, approximately, of which 79 sq mi is probably noncontributing.

Records available.--May 1957 to June 1965. See also Note below.

Gage.--Water-stage recorder and concrete control. Datum of gage is 369 ft above mean sea level (by stadia survey).

Average discharge.--8 years, 4.14 mgd (6.41 cfs).

Extremes.--Maximum discharge during year, 736 mgd (1,140 cfs) May 5 (gage height, 6.14 ft), from rating curve extended above 190 mgd by logarithmic plotting; no flow for many days.
1957-65: Maximum discharge, that of May 5, 1965; no flow at times each year.

Remarks.--Records good. Board of Water Supply, County of Hawaii, diverts about 25,000,000 gal per year above station at 1,500-ft elevation.

Note.--Published records for high-water periods in fiscal years 1958-60 have been found to be in error; revised records are on file in the district office and will be published in the next water-supply paper.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.3	0	1.4	2.90
.4	.01	1.7	5.60
.5	.05	2.2	12.5
.6	.10	2.6	22.5
.8	.30	3.0	39.5
.9	.50	3.5	76.0
1.1	1.10	4.0	136
1.2	1.60	4.5	222

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1		0	0	0	0	0	0		0	0	2.04	
2	(*)	.46	0	0	0	0	0		0	0	1.00	
3		0	0	0	0	0	0		53.0	0	18.7	
4		0	0	0	0	0	0		21.5	0	*112	
5		0	0	0	2.60	0	0		*.89	*23.5	89.8	
6		0	0	0	*87.2	0	0		4.21	63.0	12.0	
7		0	0	0	*99.2	0	0		.01	14.2	19.0	
8		0	0	0	174	0	0		0	3.70	9.95	(*)
9		0	0	0	131	0	0		0	*4.15	5.29	
10		0	0	0	129	0	0		0	10.6	30.8	
11		0	0	0	*129	0	0		0	3.88	9.68	
12		0	0	0	106	6.90	0		0	.44	4.33	
13		0	0	0	65.9	0	0		0	.01	1.27	
14		*0	0	*0	45.5	0	0		0	0	.05	
15		0	0	0	29.2	0	0		0	0	0	
16		0	10.7	0	17.1	0	0		0	0	0	
17		0	3.74	0	8.70	0	0		0	0	0	
18		0	0	0	*3.70	0	0		0	0	0	
19		0	0	0	*1.10	0	0		0	0	0	
20		0	0	0	*.09	0	0		0	.21	0	
21		0	0	7.02	0	0	0		0	.01	0	
22		0	0	.74	0	0	0		0	0	0	
23		0	0	.03	0	0	180		0	0	0	
24		0	0	0	0	0	3.71		0	0	0	
25		0	0	0	0	0	0	(*)	0	0	0	
26		0	0	0	0	0	0		0	0	0	
27		0	0	.54	0	0	0		0	0	0	
28		0	0	0	0	0	0		0	0	0	
29		0	0	0	0	0	0	---------	0	0	0	
30		0	0	0	0	0	0	---------	0	*0	0	
31		0	---------	0	---------	*0	0	---------	0	---------	0	---------
Total	0	0.46	14.44	8.33	1029.29	6.90	183.71	0	79.61	123.70	315.91	0
Mean												
Mgd	0	0.015	0.481	0.269	343	0.223	5.93	0	2.57	4.12	10.2	0
Cfs	0	0.023	0.744	0.416	53.1	0.345	9.18	0	3.98	6.37	15.8	0
Ac-ft	0	1.4	44	26	3,160	21	564	0	244	380	969	0

Calendar Year 1964: Max 393 Min 0 Mean mgd 9.83 Mean cfs 15.2 Ac-ft 11,040
Fiscal Year 1964-65: Max 180 Min 0 Mean mgd 4.83 Mean cfs 7.47 Ac-ft 5,410

* Discharge measurement or observation of no flow made on this day.

Peak discharge (base, 200 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
11- 5	0300	5.03	349	540	3-3	1230	4.78	285	441
11- 7	0300	5.29	427	661	4-6	1015	5.10	370	572
11-11	0930	4.41	204	316	5-5	1630	6.14	736	1,140
1-23	1800	5.82	608	941					

7017. Wailuku River near Pua Akala

Location.--Lat 19°46'24", long 155°22'01", on right bank 50 ft upstream from Keanakolu Road, 2.4 miles southwest of Pua Akala, and 18 miles west of Hilo.

Drainage area.--10.2 sq mi.

Records available.--January 1964 to October 1965 (discontinued).

Gage.--Water-stage recorder. Altitude of gage is 6,840 ft (from topographic map).

Extremes.--1964-65: Maximum discharge during fiscal year, 62.2 mgd (96.2 cfs) May 8 (gage height, 2.51 ft), from rating curve extended above 15 mgd as explained below; no flow for many days.
1965: No flow during period July to October.
1964-65: Maximum discharge, 115 mgd (178 cfs) Mar. 8, 1964 (gage height, 2.90 ft), from rating curve extended above 15 mgd by logarithmic plotting; no flow for many days each year.

Remarks.--Records fair except those for period of no gage-height record, which are poor. No diversion above station. No flow during period July 1 to Oct. 31, 1965.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.99	0	1.4	1.50
1.0	.01	1.5	2.80
1.1	.04	1.6	4.70
1.2	.20	1.7	7.30
1.3	.67		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	(*)	0		0	0					0	0	
2		*0		0	0					0	0	
3		0		0	0					0	0	
4		0		0	0					0	4.53	
5		0		0	.1					0	.02	
6		0		0	2.0					6.61	.20	
7		0		0	2.0					.30	.47	
8		0		0	5.0					0	1.90	
9		.05	(*)	0	4.0					0	.01	
10		0		0	3.0					0	0	
11		0		0	1.0			(*)		0	0	
12		0		*0	*.01					0	0	
13		0		0	0		(*)			0	0	
14		0		0	0	(*)				0	0	
15		0		0	0				(*)	*0	0	
16		0		0	0					0	0	
17		0		0	0					0	0	
18		0		0	0					0	0	
19		0		0	0					0	0	
20		0		0	0					0	0	
21		0		.01	0					0	0	
22		0		.01	0					0	0	
23		0		0	0					0	0	
24		0		0	0					0	*0	
25		0		0	0					0	0	
26		0		0	0					0	0	
27		0		0	0					0	0	
28		0		0	0					0	0	
29		0		0	0			---------		0	0	
30		0		0	0			---------		0	0	
31		0	---------	0	---------			---------		---------	0	---------
Total	0	0.05	0	0.02	17.11	0	0	0	0	6.91	7.13	0
Mean												
Mgd	0	0.002	0	0.0006	0.570	0	0	0	0	0.230	0.230	0
Cfs	0	0.003	0	0.0009	0.882	0	0	0	0	0.356	0.356	0
Ac-ft	0	0.2	0	0.1	53	0	0	0	0	21	22	0

Calendar Year 1964: Max 30.0 Min 0 Mean mgd 0.194 Mean cfs 0.300 Ac-ft 218
Fiscal Year 1964-65: Max 6.61 Min 0 Mean mgd 0.086 Mean cfs 0.133 Ac-ft 96

Peak discharge (base, 20 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
11-8	-	2.16	30.2	46.7	5-4	0100	2.00	20.0	30.9
4-6	0900	2.48	58.8	91.0	5-8	1300	2.51	62.2	96.2

* Discharge measurement or observation of no flow made on this day.
Note.--No gage-height record Oct. 12 to Nov. 11.

7040. Wailuku River at Piihonua

Location.--Lat 19°42'58", long 155°09'13", on left bank 0.2 mile downstream from Hookelekele Stream, 0.9 mile west of Piihonua, and 4.1 miles west of Hilo Post Office.

Drainage area.--125 sq mi.

Records available.--July 1928 to July 1940, October 1940 to December 1947, April 1948 to June 1965. Monthly discharge only July 1928, published in WSP 1319. Prior to July 1963, published as "above Hilo Boarding School ditch intake, near Hilo."

Gage.--Water-stage recorder (digital). Altitude of gage is 1,070 ft (from topographic map).

Average discharge.--35 years (1928-40, 1941-47, 1948-65), 179 mgd (277 cfs).

Extremes.--Maximum discharge during year, 11,900 mgd (18,400 cfs) Apr. 6 (gage height, 18.13 ft); minimum, 5.04 mgd (7.80 cfs) Mar. 2.
1928-65: Maximum discharge, 41,000 mgd (63,400 cfs) Aug. 11, 1940 (gage height, 28.6 ft, from floodmarks), from rating curve extended above 6,600 mgd; minimum, 0.16 mgd (0.25 cfs) Mar. 9, 1941.

Remarks.--Records fair except those for periods of no gage-height record, which are poor. Hawaii County Board of Water Supply diverts about 4 mgd above station for domestic supply. Kapehu ditch diverted from Kapehu Stream into Wailuku River above station 1938-63.

Rating table (gage height, in feet, and discharge, in million gallons a day)

1.5	6.00	5.0	246
1.6	8.00	6.0	389
2.0	19.0	8.0	775
2.5	40.0	9.0	1,080
3.0	69.0	10.0	1,500
4.0	141	12.0	2,690

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	83.4	55.2	21.4	55	73.2	21.8	40.0	32	6.00	*25.3	38.0	53.4
2	72.0	1.140	193	60	*72.0	20.0	47.4	30	25.7	31.8	107	101
3	75.0	257	60.6	65	78.0	19.7	122	28	1.010	47.4	616	65.4
4	119	186	54.6	50	263	*17.7	79.2	35	484	93.3	2.290	72.6
5	76.8	145	72.6	55	449	15.5	44.0	30	266	1.140	536	232
6	58.2	106	47.4	70	1.700	14.6	36.0	25	498	2.490	642	140
7	50.4	79.8	52.2	90	1.590	13.5	32.3	30	215	1.270	522	85.2
8	60.0	94.7	50.4	70	2.520	19.0	30	60	125	700	770	64.8
9	43.5	193	60	*55	2.200	253	30	40	90.5	450	1.280	52.8
10	37.5	111	80	44.0	1.720	75.0	40	30	131	250	664	43.0
11	44.5	83.4	90	37.5	1.660	84.6	30	25	99.6	200	340	39.5
12	94.7	106	60	32.8	911	407	25	20	75.6	150	227	80.4
13	75.0	135	90	29.3	454	118	20	20	54.0	118	167	60.6
14	*47.4	86.4	110	25.7	321	174	20	100	43.5	96.1	126	*48.6
15	76.8	70.8	80	46.8	247	141	18	50	39.5	85.2	102	43.0
16	47.4	59.4	150	60.6	193	135	16	30.5	38.5	76.2	89.1	44.5
17	42.0	64.8	200	32.3	146	169	15	22.2	29.7	61.2	78.6	43.0
18	35.0	68.4	150	31.0	116	87.7	14	17.1	25.7	52.2	79.2	32.3
19	42.0	49.8	100	28.9	97.5	88.4	13	15.2	22.9	64.2	65.4	29.7
20	39.0	39.5	80	180	82.2	107	12.4	22.9	20.4	176	103	134
21	31.0	35.0	70	258	70.2	55.2	11.6	21.1	19.0	93.3	109	126
22	31.8	30.5	60	151	59.4	43.0	10.8	16.4	58.2	64.8	61.2	71.4
23	110	26.9	50	166	51.6	35.5	881	13.2	215	49.8	48.6	51.6
24	98.9	*23.7	45	138	43.5	30.1	200	11.6	81.6	41.5	46.8	41.5
25	44.5	21.1	40	122	38.0	50.4	110	10.1	45.6	36.0	82.8	37.5
26	35.5	20.8	35	113	34.1	36.0	85	9.15	29.7	32.3	171	34.1
27	29.7	82.8	40	326	32.3	31.4	70	8.46	25.7	28.5	93.3	38.0
28	26.1	65.4	60	128	28.9	26.1	60	7.00	23.3	24.9	73.8	32.3
29	24.1	25.3	80	92.6	25.7	22.9	*50	---------	20.8	22.5	65.4	29.7
30	61.8	21.1	65	75.6	23.7	20.8	39.0	---------	31.4	22.2	71.4	24.9
31	57.0	24.9	---------	93.3	---------	21.8	35	---------	38.0	---------	51.0	---------
Total	1.770.0	3.508.7	2.347.2	2.782.4	15.300.3	2.354.7	2.236.7	759.91	3.888.90	7.992.7	9.716.6	1.952.8
Mean												
Mgd	57.1	113	78.2	89.8	510	76.0	72.2	27.1	125	266	313	65.1
cfs	88.3	175	121	139	789	118	112	41.9	193	412	484	101
Ac-ft	5.430	10.770	7.200	8.540	46.950	7.230	6.860	2.330	11.930	24.530	29.820	5.990

Calendar Year 1964:	Max	4.770	Min	2.60	Mean mgd	275	Mean cfs	425	Ac-ft	309.200
Fiscal Year 1964-65:	Max	2.520	Min	6.00	Mean mgd	150	Mean cfs	232	Ac-ft	167.600

Peak discharge (base, 5,600 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
11-6	0115	16.23	8,010	12,400	5-9	1700	15.94	7,430	11,500
4-6	0930	18.13	11,900	18,400					

* Discharge measurement made on this day.
Note.--No gage-height record Sept. 9 to Oct. 9, Jan. 8-19, 24-29, Jan. 31 to Feb. 15, Apr. 8-12.

7176. Alia Stream near Hilo

Location.--Lat 19°50'40", long 155°06'15", on left bank 10 ft downstream from culvert on Mamalahoa Highway at Pepeekeo, 2.2 miles southeast of Honomu, and 8 miles north of Hilo.

Drainage area.--0.58 sq mi.

Records available.--April 1962 to June 1965.

Gage.--Water-stage recorder. Datum of gage is 489 ft above mean sea level (by stadia survey).

Extremes.--Maximum discharge during year, 254 mgd (393 cfs) Nov. 8 (gage height, 4.12 ft), from rating curve extended above 28 mgd; minimum, 2.88 mgd (4.46 cfs) Dec. 7.

1962-65: Maximum discharge, that of Nov. 8, 1964; minimum, 0.70 mgd (1.08 cfs) sometime during period Jan. 24 to Feb. 12, 1963.

Remarks.--Records good except those above 60 mgd, which are fair, and those for periods of no gage-height record, which are poor. No diversion above station. Spring water not used by sugar mills enters stream above station.

Rating tables (gage height, in feet, and discharge, in million gallons a day)

July 1 to Mar. 3

1.0	2.70	2.2	28.0
1.3	5.90	2.5	43.0
1.6	10.7		

Mar. 4 to June 30

1.1	4.10	1.8	17.0
1.3	6.90	2.3	32.0

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	6.74	5.18	7.00	8.0	9.08	4.04	6.74	5.5	5.0	7.24	9.10	7.75
2	6.60	13.2	16.4	7.78	8.74	3.82	9.00	4.8	22	7.07	14.5	11.3
3	6.74	5.54	9.80	8.26	8.42	3.71	9.80	4.5	27	9.93	19.3	9.17
4	7.46	6.38	8.42	6.74	12.4	3.71	9.26	4.4	20	7.75	27.6	*8.60
5	6.74	9.80	8.42	7.46	22.1	3.42	7.02	4.3	15	27.4	12.5	12.9
6	6.32	8.58	6.74	7.78	24.5	3.33	4.70	4.4	16	30.9	11.9	10.1
7	6.18	8.10	7.78	9.80	33.2	*3.24	3.93	4.2	14	14.5	11.5	9.17
8	6.04	11.6	7.16	8.26	41.0	5.07	3.93	4.48	13	8.79	11.7	8.60
9	5.90	11.3	8.58	7.30	*20.7	9.26	4.26	4.26	11.7	8.09	11.8	8.09
10	5.90	9.26	8.74	6.60	25.1	8.46	6.13	4.04	12.0	7.58	14.7	7.24
11	6.18	9.08	9.26	6.18	28.9	7.78	7.02	4.04	11.5	7.07	10.9	7.07
12	6.60	12.4	8.90	5.66	19.5	16.1	6.32	4.04	8.98	6.75	10.5	8.79
13	6.18	*12.1	9.44	5.42	14.5	6.73	4.82	4.04	8.43	6.90	9.93	8.26
14	5.90	9.44	9.98	5.30	12.5	6.92	4.48	4.82	7.75	6.30	9.36	7.75
15	6.74	8.90	8.90	8.26	11.4	7.30	4.48	9.00	9.74	7.24	8.98	7.24
16	*5.78	7.46	10.8	9.98	10.2	7.62	4.15	5.90	10.5	6.45	8.09	7.07
17	5.54	8.10	13.2	6.88	9.44	8.10	4.15	9.98	7.75	5.85	8.98	7.41
18	5.54	8.58	*12.5	6.18	8.58	6.60	3.82	6.04	7.07	5.01	9.17	6.60
19	5.54	6.88	8.90	6.60	7.78	6.18	3.71	6.18	6.90	5.40	8.98	5.70
20	5.66	6.18	7.5	11.2	7.16	6.74	3.42	9.44	6.30	7.24	8.26	8.07
21	5.66	5.90	6.5	11.2	6.60	5.30	*3.42	8.90	6.00	6.60	9.36	8.09
22	5.54	5.54	6.1	12.5	6.18	4.59	10	7.78	9.22	5.85	7.58	7.92
23	5.42	5.42	5.8	11.4	5.90	4.04	30	*5.30	12.1	6.45	6.45	7.24
24	5.42	5.18	5.6	10.7	5.66	4.15	20	4.2	11.5	6.75	6.00	6.60
25	5.18	5.18	5.4	12.8	5.30	5.42	15	10	15.5	6.60	9.04	6.15
26	5.42	5.06	5.2	*25.9	4.70	5.54	11	6.0	11.5	6.00	10.1	6.30
27	5.42	4.82	6.0	14.8	4.82	4.70	8.58	8.0	10.3	5.40	9.36	6.15
28	5.18	4.82	7.5	7.94	4.59	3.93	6.88	6.0	8.98	5.85	8.60	6.30
29	5.18	4.26	9.0	8.58	4.26	3.42	7.0	---------	8.09	*6.30	7.58	6.30
30	6.65	4.15	8.5	8.74	4.15	4.15	7.0	---------	*7.75	6.60	7.24	5.27
31	4.59	7.94	---------	8.74	---------	4.48	6.0	---------	8.26	---------	6.15	---------
Total	183.94	236.33	254.02	282.94	387.36	177.85	236.02	164.54	349.82	255.86	325.21	233.20
Mean												
Mgd	5.93	7.62	8.47	9.13	12.9	5.74	7.61	5.88	11.3	8.53	10.5	7.77
Cfs	9.18	11.8	13.1	14.1	20.0	8.88	11.8	9.10	17.5	13.2	16.2	12.0
Ac-ft	564	725	780	868	1190	546	724	505	1070	785	998	716

Calendar Year 1964:	Max	47.1	Min	2.88	Mean mgd	8.04	Mean cfs	12.4	Ac-ft	9030
Fiscal Year 1964-65:	Max	41.0	Min	3.24	Mean mgd	8.46	Mean cfs	13.1	Ac-ft	9470

Peak discharge (base, 100 mgd, revised)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-26	2330	3.59	154	238	12-12	0930	3.76	182	282
11- 6	0030	3.53	144	223	1-23	-	3.83	196	303
11- 8	0330	4.12	254	393	4- 6	0830	4.07	244	378
11-11	0900	3.45	132	204	5- 4	0030	3.40	125	193

* Discharge measurement made on this day.

Note.--No gage-height record Sept. 20 to Oct. 1, Jan. 22-26, Jan. 29 to Feb. 7, Feb. 24 to Mar. 8.

7178. Pohakupuka Stream near Papaaloa

Location.--Lat 19°57'20", long 155°11'20", on right bank 200 ft downstream from Mamalahoa Highway, 2.8 miles northwest of Honohina, and 3.0 miles southwest of Papaaloa.

Drainage area.--2.76 sq mi (revised).

Records available.--April 1962 to June 1965.

Gage.--Water-stage recorder. Altitude of gage is 200 ft (from topographic map).

Extremes.--Maximum discharge during year, 3,280 mgd (5,070 cfs) Nov. 7 (gage height, 13.06 ft), from rating curve extended above 670 mgd by logarithmic plotting; minimum, 0.85 mgd (1.32 cfs) Jan. 21.
1962-65: Maximum discharge, that of Nov. 7, 1964; minimum, 0.18 mgd (0.28 cfs) Nov. 9, 1962.
Revisions.--The maximum discharge for the fiscal year 1964 has been revised to 1,960 mgd (3,030 cfs) Mar. 1, 1964 (gage height, 10.42 ft), superseding figure published in Surface Water Records of Hawaii and other Pacific Areas (1964).

Remarks.--Records good except those above 1,500 mgd, which are fair. No diversion above station. Irrigation ditches in basin occasionally overflow, but amount reaching stream is small.

Revisions.--Revised figures of discharge for some peak discharges in the fiscal year 1964, superseding those published in Surface Water Records of Hawaii and other Pacific Areas (1964), are given herewith: Feb. 15 (0600) 1,620 mgd (2,510 cfs), 9.60 ft; Mar. 1 (1900) 1,960 mgd (3,030 cfs), 10.42 ft.

Rating tables (gage height, in feet, and discharge, in million gallons a day)

July 1 to Nov. 6

1.5	1.70
1.6	2.80
1.7	4.20
1.9	8.00

Note.--Same as following table above 1.9 ft.

Nov. 7 to Apr. 6

1.2	0.70
1.4	1.80
1.7	4.60
1.9	8.00
2.1	13.5
2.5	30.0
3.0	61.0
4.0	155
5.0	284
6.0	466

Apr. 7 to June 30

1.2	1.60
1.3	2.10
1.6	4.60
1.9	9.00
2.1	14.0
2.5	30.0

Note.--Same as preceding table above 2.5 ft.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	6.40	7.53	3.22	4.74	5.46	3.72	1.68	2.87	2.60	2.44	4.09	3.28
2	11.4	12.2	25.0	4.06	4.74	3.50	1.80	2.52	71.2	2.96	6.31	37.1
3	12.3	13.8	6.40	5.46	4.20	3.41	1.80	2.36	216	4.71	38.6	6.55
4	20.1	18.6	4.56	3.36	18.8	*3.41	1.74	2.20	115	2.36	8.63	*3.36
5	8.25	9.25	2.94	3.50	105	3.32	1.62	2.12	16.7	97.3	10.6	19.9
6	4.74	5.28	2.47	4.06	156	3.14	1.56	2.36	19.5	*367	8.88	7.64
7	3.78	3.92	2.80	13.6	381	3.05	1.50	2.04	6.60	93.9	9.57	4.20
8	3.64	7.80	3.22	4.92	336	3.32	1.44	2.44	4.60	25.5	11.2	2.96
9	3.50	26.8	7.40	3.64	141	9.22	1.44	3.05	3.83	15.9	32.2	2.59
10	3.08	5.82	4.56	3.36	139	4.27	1.50	2.04	3.14	7.81	11.1	2.31
11	2.80	4.74	6.00	3.08	113	29.1	1.44	1.88	2.69	6.10	5.20	*2.31
12	7.03	10.0	10.2	2.80	60.0	124	1.44	1.80	2.69	4.96	4.00	7.88
13	4.20	*12.3	11.1	2.58	18.2	6.80	1.44	1.74	3.32	4.72	3.52	4.30
14	2.94	5.46	10.5	2.36	13.2	5.86	1.96	2.04	2.96	68.5	3.28	2.88
15	18.8	4.56	7.60	3.08	10.8	4.27	1.32	3.05	17.3	22.6	3.20	2.31
16	*4.56	3.50	*49.2	4.74	10.0	3.61	1.26	2.20	8.73	9.60	3.12	2.05
17	3.78	3.36	45.1	2.58	8.50	4.16	1.20	49.9	3.41	7.15	2.88	*2.24
18	3.08	6.60	36.9	2.36	7.60	3.72	1.15	3.83	2.78	7.66	2.80	2.10
19	6.00	3.64	6.20	10.4	7.40	3.14	1.10	6.29	2.52	9.08	2.59	1.90
20	6.80	2.69	4.38	113	6.80	3.14	1.05	27.8	2.36	6.55	2.59	13.9
21	6.80	2.47	3.64	95.7	6.00	2.78	*4.55	16.1	2.28	4.96	2.52	9.57
22	5.10	2.36	3.22	55.3	5.44	2.52	27.5	5.02	52.9	4.20	2.45	3.90
23	4.06	2.25	2.80	44.6	5.16	2.36	227	*3.41	15.9	3.90	2.31	*3.52
24	4.06	2.14	2.58	23.0	4.88	2.20	24.1	2.52	40.0	3.60	4.03	2.66
25	2.69	2.03	2.47	28.6	4.60	2.20	20.8	18.3	83.2	3.52	5.05	2.24
26	2.47	2.14	2.36	*64.7	5.54	2.12	11.8	4.50	5.58	3.28	7.90	2.10
27	2.25	2.03	2.69	61.4	4.38	2.04	5.02	6.32	4.88	3.20	4.60	2.05
28	2.14	1.92	7.80	10.2	4.05	1.88	3.61	3.50	3.14	3.12	2.96	2.00
29	2.14	1.92	31.2	7.00	3.94	1.80	5.72	---------	2.60	*3.04	2.52	1.85
30	31.2	1.81	5.82	6.00	3.72	1.74	3.94	---------	*2.97	3.12	2.31	1.75
31	14.0	15.0	---------	6.00	---------	1.74	3.72	---------	4.05	---------	2.24	---------
Total	214.09	203.92	314.33	600.18	1594.41	251.54	367.20	184.20	725.43	802.74	213.25	163.40
Mean												
Mgd	6.91	6.58	10.5	19.4	53.1	8.11	11.8	6.58	23.4	26.8	6.88	5.45
Cfs	10.7	10.2	16.2	30.0	82.2	12.5	18.3	10.2	36.2	41.5	10.6	8.43
Ac-ft	657	626	965	1,840	4,890	772	1,130	565	2,230	2,460	654	501

Calendar Year 1964:	Max	426	Min	1.74	Mean mgd	23.3	Mean cfs	36.1	Ac-ft	26,150		
Fiscal Year 1964-65:	Max	381	Min	1.05	Mean mgd	15.4	Mean cfs	23.8	Ac-ft	17,290		

* Discharge measurement made on this day.

Peak discharge (base, 600 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
11- 7	0200	13.06	3,280	5,070	4- 6	0830	10.60	2,050	3,170
1-23	2000	8.30	1,100	1,700	4-14	2130	8.60	1,220	1,890

7200. Kawainui Stream above Upper Hamakua ditch, near Kamuela

Location.--Lat 20°05'18", long 155°40'58", on left bank 250 ft upstream from Upper Hamakua ditch intake and 4.5 miles north of Kamuela.

Drainage area.--1.58 sq mi.

Records available.--January 1964 to June 1965.

Gage.--Water-stage recorder (digital). Altitude of gage is 4,060 ft (from topographic map).

Extremes.--Maximum discharge during year, 502 mgd (777 cfs) Dec. 12 (gage height, 6.01 ft), from rating curve extended above 22 mgd by logarithmic plotting; minimum, 0.11 mgd (0.17 cfs) May 1.
1964-65: Maximum discharge, that of Dec. 12, 1964; minimum, that of May 1, 1965.

Remarks.--Records good except those above 50 mgd, which are fair, and those for periods of no gage-height record, which are poor. No diversion above station.

Rating table (gage height, in feet, and discharge, in million gallons a day)

1.1	0.04	1.7	5.00
1.2	.27	2.0	11.1
1.3	.70	2.5	29.0
1.4	1.40	3.0	58.0
1.5	2.30	3.5	99.0

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	20	6.0	3.65	1.49	9.0	0.7	1.12	3.38	1.49	0.61	3.90	11.1
2	15	50	5.85	4.55	12	1.0	.66	2.49	23.7	.57	11.2	27.0
3	5.0	15	2.21	6.90	15	1.8	.53	4.25	67.0	.53	5.10	7.70
4	6.0	6.0	4.25	6.02	6.0	1.58	.40	1.94	28.2	8.50	4.25	3.65
5	20	4.0	6.90	35.0	21	.84	.36	1.40	7.30	40.2	3.26	12.2
6	6.0	3.0	5.51	10.9	37	.57	.27	1.05	7.50	68.7	4.10	24.2
7	3.0	2.5	14.2	16.2	27	.48	.25	.77	4.55	21.0	18.2	12.8
8	2.0	10	13.1	5.68	45	.84	.22	.66	*4.40	27.4	7.15	7.70
9	1.2	30	13.6	2.42	11	5.68	.20	.57	3.65	21.8	3.38	*2.54
10	.9	8.0	5.85	2.90	32	5.51	.48	.48	1.85	4.70	1.67	1.33
11	2.0	*13	7.10	2.12	35	14.6	.61	.48	1.33	1.94	.98	12.5
12	5.0	19	5.34	1.12	22	90.1	.36	.40	4.79	1.19	.61	13.3
13	6.0	9.0	11.9	.77	4.0	4.10	.27	.31	2.03	.77	.48	3.80
14	30	4.0	*9.90	.70	2.0	2.42	.22	.27	1.33	.61	.40	2.12
15	*40	3.0	3.95	*5.85	1.5	1.58	.20	3.67	4.76	.57	.36	1.12
16	3.02	13	31.5	13.1	1.2	1.19	.22	7.24	4.25	.40	.36	1.12
17	2.21	7.0	52.4	5.0	1.0	10.2	.22	15.3	1.67	.31	.25	1.05
18	7.30	8.0	24.6	2.0	1.0	1.85	.20	6.82	1.05	.25	.22	.84
19	31.5	4.0	4.10	20	2.5	8.98	.18	19.5	.77	.25	.22	2.03
20	25.4	2.5	3.95	25	2.0	4.48	.18	22.2	.66	.27	.20	14.2
21	36.0	1.8	6.36	50	1.5	*1.49	.20	11.1	.57	.22	.18	6.19
22	6.53	1.5	3.14	30	1.0	.98	45.5	9.35	6.42	.20	.16	2.12
23	36.5	1.3	1.49	35	.9	.70	54.8	3.65	11.3	.18	.13	1.67
24	10	1.1	.91	12	*.7	.57	15.1	2.78	10.2	.16	.16	1.05
25	4.0	.9	.91	22	.6	.48	2.54	13.0	19.6	.16	.27	.66
26	3.0	.8	.77	30	.5	.40	4.25	4.55	3.26	*.13	1.12	.53
27	2.5	.7	23.8	15	.4	.36	2.30	7.50	1.40	.13	1.33	.77
28	6.0	2.78	27.4	3.0	.4	.31	*1.26	2.90	.91	.16	.91	7.30
29	15	1.58	28.6	2.0	.3	.36	3.74	---------	.98	.16	4.70	3.65
30	45	10.1	2.42	1.5	.3	.77	7.89	---------	1.05	.13	4.10	1.76
31	8.0	34.0	---------	4.0	---------	2.54	22.6	---------	.77	---------	1.26	---------
Total	404.06	273.56	325.66	372.22	293.8	167.46	167.33	148.01	228.74	202.20	80.61	188.00
Mean												
Mgd	13.0	8.82	10.9	12.0	9.79	5.40	5.40	5.29	7.38	6.74	2.60	6.27
Cfs	20.1	13.6	16.9	17.0	15.1	8.36	8.36	8.18	11.4	10.4	4.02	9.70
Ac-ft	1,240	840	999	1,140	902	514	514	454	702	621	247	577

Calendar Year 1964:	Max	108	Min	0.3	Mean mgd	11.2	Mean cfs	17.2	Ac-ft	12,570
Fiscal Year 1964-65:	Max	90.1	Min	0.13	Mean mgd	7.81	Mean cfs	11.9	Ac-ft	8,750

Peak discharge (base, 200 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
9-17	2145	4.45	208	322	4-6	0900	4.64	235	364
12-12	0530	6.01	502	777					

* Discharge measurement made on this day.

Note.--No gage-height record July 1-15, July 24 to Aug. 27, Oct. 17 to Dec. 3.

7205. Upper Hamakua ditch below Kawaiki Stream, near Kamuela

Location.--Lat 20°05'15", long 155°40'42", on right bank 800 ft downstream from Kawaiki Stream intake and 4.4 miles north of Kamuela.

Records available.--January 1964 to June 1965.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 4,020 ft (from topographic map).

Extremes.--1964-65: Maximum daily discharge, 21.5 mgd (33.3 cfs) Mar. 3, 1965; minimum daily, 0.08 mgd (0.12 cfs) May 23, 1965.

Remarks.--Records good except those for periods of fragmentary or no gage-height record, which are poor. Ditch diverts from Kawainui and Kawaiki Streams for irrigation near Kamuela. Continuous records of rainfall are obtained at station.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	9.45	8.76	5.28	2.50	10	0.82	1.20	4.08	1.60	0.65	0.78	13.2
2	12.8	19.1	8.22	6.63	12	1.14	.76	2.80	f7.54	.58	7.13	18.2
3	11.1	13.6	3.48	10.3	13	2.40	.54	5.62	f21.5	.48	7.52	12.0
4	13.9	6.96	6.99	6.39	8.0	2.20	.44	2.30	18.8	4.37	5.76	6.04
5	17.0	4.92	9.79	18.8	14	1.09	.40	1.60	8.03	20.7	4.56	15.0
6	9.28	2.80	8.28	13.8	18	.76	.30	1.14	9.29	20.4	6.46	20.0
7	3.36	2.82	13.5	15.7	15	.62	.30	.87	4.92	19.2	9.56	18.2
8	1.92	17.2	10.8	7.85	20	1.42	.24	.65	*5.28	16.5	9.77	13.4
9	1.44	17.6	13.3	3.84	12	6.34	.24	.58	4.08	17.4	5.67	*3.72
10	1.04	8.31	7.91	4.67	18	7.19	1.49	.48	1.92	5.52	2.40	1.84
11	5.29	*11.5	9.36	2.90	19	f8.54	.92	.48	1.28	2.40	1.20	9.54
12	11.9	16.3	7.08	1.76	14	f17.8	.44	.40	5.78	1.36	.82	14.0
13	7.04	11.4	13.5	1.20	4.5	5.16	.34	.30	2.20	.98	.58	7.07
14	13.2	4.92	*12.5	1.20	2.0	3.00	.27	.27	1.36	.76	.44	2.90
15	*15.8	2.90	5.88	*8.34	1.5	1.84	.24	4.02	6.45	.62	.44	1.60
16	4.20	7.18	13.5	15.1	1.3	1.36	.27	6.63	5.10	.44	.40	1.68
17	3.48	7.09	14.5	6.43	1.2	10.1	.24	15.2	1.76	.34	.30	1.44
18	4.07	10.2	16.7	2.30	1.3	2.40	.18	7.81	1.04	.30	.21	1.58
19	17.4	3.24	5.88	16.9	2.4	6.78	.15	19.5	.76	.27	.18	3.66
20	16.8	1.76	5.96	18.6	2.0	5.84	.12	20.2	.58	.30	.15	11.3
21	17.9	1.20	9.40	19.9	1.5	*1.92	.18	13.3	.51	.24	.12	10.7
22	8.42	1.14	4.80	18.7	1.2	1.28	f19.0	12.0	7.32	.18	.10	3.00
23	14.4	1.04	2.40	17.6	1.0	.87	f21.0	4.56	11.3	.15	.08	2.30
24	9.98	.87	1.60	f15.3	*.9	.65	13.3	3.36	8.46	.12	.10	1.44
25	3.24	.70	1.76	17	.70	.54	3.36	14.3	17.2	.10	.34	.92
26	2.10	.62	1.60	12	.62	.48	5.34	5.28	3.84	*.10	2.20	.65
27	3.42	.58	7.70	5.0	.54	.40	3.00	10.0	1.68	.10	2.10	1.83
28	8.37	5.18	18.7	3.5	.51	.37	*1.52	3.36	.98	.12	1.20	9.57
29	16.2	2.80	15.1	2.4	.48	.44	5.16	---------	1.04	.12	7.57	6.75
30	17.3	7.52	3.96	2.0	.48	.87	7.73	---------	1.14	.10	5.00	2.40
31	12.6	16.5	---------	2.5	---------	2.90	16.9	---------	.76	---------	1.68	---------
Total	294.40	216.71	259.43	281.11	197.13	97.52	105.57	161.09	163.50	114.90	84.82	215.93
Mean												
Mgd	9.50	6.99	8.65	9.07	6.57	3.15	3.41	5.75	5.27	3.83	2.74	7.20
Cfs	14.7	10.8	13.4	14.0	10.2	4.87	5.28	8.90	8.15	5.93	4.24	11.1
Ac-ft	903	665	796	863	605	299	324	494	502	353	260	663

Calendar Year 1964:	Max	20.0	Min	0.37	Mean mgd	7.26	Mean cfs	11.2	Ac-ft	8160
Fiscal Year 1964-65:	Max	21.5	Min	0.08	Mean mgd	6.01	Mean cfs	9.30	Ac-ft	6730

* Discharge measurement made on this day.
f Fragmentary gage-height record.
Note.--No gage-height record Oct. 25 to Nov. 24.

7250. Alakahi Stream above Upper Hamakua ditch, near Kamuela

Location.--Lat 20°04'27", long 155°40'25", on right bank 25 ft upstream from Upper Hamakua ditch intake and 3.5 miles north of Kamuela.

Drainage area.--0.87 sq mi.

Records available.--January 1964 to June 1965.

Gage.--Water-stage recorder (digital). Altitude of gage is 3,900 ft (from topographic map).

Extremes.--Maximum discharge during year, 67.2 mgd (104 cfs) Dec. 12 (gage height, 4.23 ft), from rating curve extended above 17 mgd as explained below; minimum, 0.02 mgd (0.03 cfs) Jan. 21, May 22-24.
1964-65: Maximum discharge, 78.0 mgd (121 cfs) Feb. 24, 1964 (gage height, 4.46 ft), from rating curve extended above 17 mgd by logarithmic plotting; minimum, that of Jan. 21, May 22-24, 1965.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Parker Ranch pipeline diverts from tributary 0.4 mile above station for ranch use in Kamuela area.

Rating tables (gage height, in feet, and discharge, in million gallons a day)

July 1 to Oct. 22		Oct. 23 to Apr. 26				Apr. 26 to June 30			
1.4	0.35	1.3	0	1.8	1.90	1.0	0	1.5	1.10
1.5	.60	1.4	.10	2.1	4.80	1.1	.03	1.7	2.40
1.7	1.50	1.5	.35	2.5	11.0	1.2	.16	2.0	5.20
1.9	2.80	1.6	.70	3.0	22.0	1.3	.38	2.5	12.7
2.1	4.80	1.7	1.20	3.5	38.0	1.4	.70	3.0	24.2
2.5	11.0								
3.0	22.0								
3.5	38.0								

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	9.0	3.0	2.0	0.8	4.93	0.28	0.12	1.48	0.75	0.28	0.23	7.52
2	7.0	27	3.0	2.5	6.40	.32	.08	.85	9.74	.25	7.52	14.7
3	2.5	8.0	1.5	4.0	7.92	.63	.08	1.48	26.2	.22	4.76	4.43
4	3.0	3.0	2.5	3.0	3.30	.70	.07	.75	13.8	2.38	4.21	1.91
5	10	2.0	4.0	17	11.6	.46	.07	.52	2.62	15.4	2.80	7.10
6	3.0	1.5	3.0	5.5	18.5	.32	.06	.38	2.22	24.7	4.01	13.9
7	2.0	1.2	7.5	8.0	13.4	.28	.05	.28	1.76	9.04	4.76	7.38
8	1.0	5.0	6.5	3.0	20.0	.28	.05	.18	*1.90	13.8	2.96	4.98
9	.8	15	7.0	1.5	5.84	1.34	.04	.15	1.27	10.1	5.32	*1.52
10	.6	4.0	3.0	1.8	16.0	2.06	.09	.12	.85	2.54	2.05	.82
11	1.0	*6.0	4.0	1.4	17.8	6.85	.28	.10	.60	1.34	.67	6.40
12	2.5	9.74	2.7	.6	11.4	22.6	.12	.10	2.14	.85	.29	6.40
13	3.0	4.80	6.0	.5	2.38	2.14	.08	.08	1.00	.52	.20	2.05
14	15	2.10	*4.5	.4	1.41	1.27	.07	.07	.60	.42	.13	1.22
15	*20	1.5	2.0	*3.0	1.00	.85	.06	.28	2.30	.30	.11	.54
16	1.5	6.0	15	7.0	.75	.66	.05	1.76	2.30	.25	.08	.54
17	1.1	3.5	25	2.5	.66	5.97	.04	6.40	.90	.25	.07	.57
18	4.5	4.0	12	1.0	.63	1.15	.03	2.46	.49	.22	.04	.36
19	15	2.0	2.5	10	1.62	3.7	.03	9.92	.38	.22	.03	1.28
20	13	1.2	2.0	12	1.27	2.14	.03	12.8	.28	.22	.03	8.85
21	18	1.0	3.0	25	.95	*.80	.03	7.30	.25	.22	.03	3.56
22	4.0	.8	2.0	10	.66	.46	16.0	4.69	4.47	.22	.02	1.28
23	18	.7	1.0	16.8	.60	.30	22.0	1.90	5.58	.12	.02	.78
24	5.0	.6	.7	6.25	*.52	.25	4.93	1.27	5.71	.10	.02	.48
25	2.5	.5	.6	11.0	.42	.15	1.48	4.69	12.4	.09	.08	.29
26	1.2	.5	.5	14.6	.35	.12	1.62	1.69	1.83	*.09	.51	.20
27	1.0	.4	12	8.08	.32	.12	1.15	3.30	.85	.08	1.22	.18
28	3.5	1.5	14	1.76	.30	.10	*.63	1.34	.52	.08	.54	2.12
29	8.0	.8	15	1.10	.25	.10	2.38	---------	.46	.08	3.65	1.40
30	25	5.0	1.5	.85	.28	.09	2.06	---------	.49	.07	2.48	.57
31	4.5	17	---------	2.22	---------	.12	7.76	---------	.35	---------	.57	---------
Total	206.2	139.34	166.0	183.16	151.46	56.61	61.54	66.34	105.01	84.45	49.41	103.33
Mean												
Mgd	6.65	4.49	5.53	5.91	5.05	1.83	1.99	2.37	3.39	2.82	1.59	3.44
Cfs	10.3	6.95	8.56	9.14	7.81	2.83	3.08	3.67	5.25	4.36	2.46	5.32
Ac-ft	633	428	509	562	465	174	189	204	322	259	152	317

Calendar Year 1964:	Max	36.6	Min	0.09	Mean mgd	5.18	Mean cfs	8.01	Ac-ft	5820
Fiscal Year 1964-65:	Max	27	Min	0.02	Mean mgd	3.76	Mean cfs	5.82	Ac-ft	4210

Peak discharge (base, 60 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
11-8	0230	4.09	61.6	95.3	3-2	2045	4.14	63.6	98.4
12-12	0630	4.23	67.2	104	4-6	0900	4.14	63.6	98.4

* Discharge measurement made on this day.

Note.--No gage-height record July 1 to Aug. 11, Aug. 15 to Oct. 22.

7322. Wailoa Stream near Waipio

Location.--Lat 20°05'28", long 155°37'01", on right bank 1.0 mile downstream from confluence of Waipio and Waima Streams, 1.8 miles southwest of Waipio, and 3.3 miles southwest of Kukuihaele.

Drainage area.--14.3 sq mi.

Records available.--August 1901 to January 1902 (prior to any upstream diversions), July 1911 to December 1912 (gage heights only), February 1964 to June 1965. Published as Waipio River at elevation 360 ft, near Waipio 1901-2 and as Waipio River below Waima Stream, near Waipio 1911-12.

Gage.--Water-stage recorder (digital since June 3). Altitude of gage is 150 ft (from topographic map). Aug. 15, 1901, to Jan. 22, 1902, and July 20, 1911, to Dec. 31, 1912, staff gage at site 1.0 mile upstream (400 ft below Waima Stream) at different datums.

Extremes.--Maximum discharge during year, 924 mgd (1,430 cfs) Dec. 12 (gage height, 5.32 ft), from rating curve extended above 190 mgd on basis of slope-area measurement at gage height 8.2 ft; minimum, 25.2 mgd (39.0 cfs) on many days in December and January.

1901-2, 1964-65: Maximum discharge, that of Dec. 12, 1964; minimum, 25.2 mgd (39.0 cfs) on many days in December 1964 and January 1965.

Maximum discharge known, 3,960 mgd (6,130 cfs) Nov. 8, 1963 (gage height, 8.2 ft, from floodmarks), result of slope-area measurement of peak flow.

Remarks.--Records good except those for period of no gage-height record, which are poor. Upper and Lower Hamakua ditches divert water out of basin from upstream tributaries for irrigation in vicinity of Kamuela and for mill and domestic use, power generation, and irrigation on Hamakua coast. Parker Ranch pipeline diverts from Alakahi Stream for ranch use in Kamuela area.

Rating tables (gage height, in feet, and discharge, in million gallons a day)

July 1 to Dec. 11				Dec. 12 to June 30			
2.6	25.0	3.5	150	2.5	21.0	3.6	153
2.7	33.0	4.0	290	2.7	36.0	4.0	265
3.1	74.0			3.1	75.0	4.5	470

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	53.1	50.0	30	*28.2	33.0	28.2	25.2	26.6	28.0	30.4	32.8	37.2
2	48.9	230	29	33.9	66.7	*29.0	25.2	31.2	134	30.4	63.7	94.0
3	30.6	58.0	29	38.4	88.1	29.0	25.9	37.4	295	30.4	41.0	*32.8
4	29.8	32.2	29	40.4	33.0	29.0	25.9	27.3	*106	54.5	32.0	27.3
5	60.3	29.8	31	144	*67.4	28.2	25.9	26.6	35.2	119	29.6	35.2
6	36.7	29.8	30	42.0	182	28.2	25.9	26.6	35.7	236	*30.4	75.0
7	29.8	29.8	45	44.0	161	28.2	*25.9	25.9	32.8	*59.0	49.1	35.2
8	29.0	72.9	52	29.8	207	28.2	25.9	25.9	32.0	82.8	35.2	31.2
9	29.0	106	60	29.0	56.5	30.6	25.9	*25.9	31.2	78.9	46.0	26.6
10	28.2	38.4	35	30.6	132	31.4	25.9	25.9	29.6	32.0	30.4	26.6
11	30.6	47.0	30	29.0	128	90.3	25.2	27.3	29.6	29.6	27.3	39.2
12	44.3	64.4	29	29.0	72.6	293	25.2	26.6	29.6	28.8	27.3	42.4
13	35.3	33.9	35	29.0	33.9	36.0	25.2	26.6	29.6	28.8	27.3	26.6
14	82.3	29.8	40	29.0	30.6	25.9	25.2	32.0	29.6	28.8	27.3	26.6
15	143	29.8	30	29.0	29.8	25.9	25.2	35.7	29.6	28.8	27.3	26.6
16	29.0	81.6	80	44.6	29.0	25.2	25.2	38.4	32.0	28.8	27.3	26.6
17	27.4	38.4	150	32.2	29.0	49.2	25.2	89.5	30.4	28.8	27.3	26.6
18	28.2	39.3	100	28.2	29.0	25.9	25.2	30.4	30.4	28.8	27.3	26.6
19	96.1	29.8	35	176	32.2	29.5	25.2	44.0	30.4	28.8	27.3	26.6
20	70.6	29.8	29	126	29.8	26.6	25.2	65.4	30.4	28.8	27.3	50.3
21	145	29.0	30	249	29.0	25.2	26.6	50.4	30.4	28.8	27.3	32.8
22	36.6	29.0	28	*149	28.2	25.2	132	32.8	36.2	28.8	27.3	26.6
23	117	29.0	26.6	176	28.2	25.2	134	28.8	46.9	29.6	28.0	26.6
24	52.7	29.0	26.6	57.0	29.0	25.2	45.0	28.0	57.0	29.6	28.0	26.6
25	29.0	29.0	27.4	74.3	28.2	25.2	35.6	45.6	158	29.6	28.0	26.6
26	29.0	*29.0	26.6	105	28.2	25.2	28.8	28.8	32.0	29.6	28.0	26.6
27	28.2	29.0	52.2	71.0	28.2	25.2	26.6	30.4	31.2	29.6	28.0	27.3
28	*34.8	38.0	88.3	32.2	28.2	25.2	25.9	28.0	31.2	29.6	28.0	28.0
29	54.1	30.6	78.0	30.6	28.2	25.2	25.9	---------	31.2	29.6	34.4	28.0
30	213	35.9	29.0	30.6	28.2	25.2	25.9	---------	30.4	29.6	32.0	27.3
31	33.9	125	---------	30.6	---------	25.2	56.4	---------	30.4	---------	28.0	---------
Total	1,735.5	1,533.2	1,340.7	2,017.6	1,754.2	1,194.7	1,072.3	968.0	1,576.0	1,336.6	980.2	1,015.6
Mean												
Mgd	56.0	49.5	44.7	65.1	58.5	38.5	34.6	34.6	50.8	44.6	31.6	33.9
Cfs	86.6	76.6	69.2	101	90.5	59.6	53.5	53.5	78.6	69.0	48.9	52.5
Ac-ft	5,330	4,710	4,110	6,190	5,380	3,670	3,290	2,970	4,840	4,100	3,010	3,120

Calendar Year 1964:	Max	-	Min	-	Mean mgd	-	Mean cfs	-	Ac-ft	-
Fiscal Year 1964-65:	Max	295	Min	25.2	Mean mgd	45.3	Mean cfs	70.1	Ac-ft	50,720

Peak discharge (base, 600 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
9-17	-	5.05	770	1,190	12-12	0700	5.32	924	1,430
11- 6	0100	4.75	605	936	3- 2	2130	5.04	754	1,170
11- 8	0330	4.83	646	1,000	4- 6	0930	4.94	694	1,070

* Discharge measurement made on this day.

Note.--No gage-height record Sept. 1-22.

7330. Lower Hamakua ditch wasteway near Kukuihaele

Location.--Lat 20°07'07", long 155°35'09", on left bank 50 ft downstream from Lower Hamakua ditch, 0.8 mile west of Kukuihaele School, and 1.0 mile northeast of Waipio.

Records available.--February 1964 to June 1965.

Gage.--Water-stage recorder and sharp-crested weir. Altitude of gage is 980 ft (from topographic map).

Extremes.--1964-65: Maximum daily discharge, 10.6 mgd (16.4 cfs) July 21, 1964; no flow most of the time.

Remarks.--Records fair. The wasteway diverts excess water from Lower Hamakua ditch.

Revisions.--Revised figures of discharge, in million gallons a day, for low-water periods in the fiscal year 1964, superseding those published in Surface Water Records of Hawaii and other Pacific Areas (1964), are given herewith:

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
1964		1964-Con.		1964-Con.		1964-Con.	
Feb. 26	1.14	Apr. 9	1.14	May 11	1.05	June 6	2.77
28	2.66	10	1.62	14	3.36	8	3.23
Mar. 4	2.33	12	1.90	20	2.88	14	4.01
9	2.11	13	1.62	21	1.34	21	4.01
16	2.88	25	1.90	23	3.23	22	1.52
25	3.1	May 5	1.24	24	4.27	23	4.27
31	3.75	6	1.52	June 5	1.43	24	1.90

Month	Million gallons	Maximum	Minimum	Mean		Runoff in acre-feet
				Mgd	Cfs	
March 1964	41.11	9.50	0	1.33	2.06	126
April	8.18	1.90	0	.273	.422	25
May	38.72	5.76	0	1.25	1.93	119
June	31.95	4.80	0	1.06	1.64	98

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0	0	2.22	*0	0	0	0	2.44	0	0	0	0
2	4.27	7.84	0	0	.84	*0	0	0	0	0	2.11	*2.55
3	0	9.20	0	2.77	7.67	0	0	3.10	5.60	0	2.77	1.03
4	0	4.01	0	0	3.88	0	0	0	*6.38	0	0	0
5	4.85	1.14	0	8.18	*5.30	0	0	0	3.49	8.52	0	0
6	3.49	0	0	6.38	*8.35	0	0	0	0	7.67	*0	2.36
7	0	0	1.90	6.38	9.74	0	*0	0	0	*3.10	0	1.61
8	0	5.45	2.11	1.14	9.74	0	0	0	0	0	0	0
9	0	9.56	5.60	0	7.67	0	0	*0	0	4.55	0	0
10	0	5.90	0	0	5.90	2.77	0	0	0	1.90	0	0
11	0	5.00	0	0	9.03	1.81	0	0	0	0	0	0
12	1.24	9.74	0	0	9.38	4.14	0	0	0	0	0	0
13	3.23	5.30	0	0	3.62	0	0	0	0	0	0	0
14	3.75	.77	1.81	0	.04	0	0	0	0	0	0	0
15	9.74	0	1.24	0	0	0	0	0	2.88	0	0	0
16	.70	0	1.9	.56	0	0	0	0	2.99	0	0	0
17	0	2.55	6.38	0	0	3.49	0	5.45	0	0	0	0
18	0	3.1	4.27	0	0	0	0	2.22	0	0	0	0
19	6.54	0	2.77	7.02	2.66	0	0	3.88	0	0	0	0
20	9.74	0	0	9.38	1.90	0	0	6.86	0	0	0	0
21	10.6	0	1.43	9.20	4.14	0	0	6.22	0	0	0	0
22	5.60	0	.42	9.20	.42	0	7.02	2.33	0	0	0	0
23	6.22	0	0	8.01	0	0	7.02	1.52	0	0	0	0
24	5.90	0	0	8.18	0	0	6.06	0	0	0	0	0
25	0	0	0	8.01	0	0	0	4.40	10.1	0	0	0
26	0	*0	0	9.20	0	0	0	0	2.33	0	0	0
27	*0	0	0	7.84	0	0	0	0	0	0	0	0
28	1.90	0	5.30	1.52	0	0	0	0	0	0	0	0
29	1.72	0	6.54	0	0	0	0	---------	0	0	0	0
30	8.86	.49	0	0	0	0	0	---------	0	0	0	0
31	4.55	7.84	---------	0	---------	0	4.85	---------	0	---------	0	---------
Total	92.90	77.89	43.89	102.97	90.28	12.21	24.95	38.42	33.77	25.74	4.88	7.55
Mean												
Mgd	3.00	2.51	1.46	3.32	3.01	0.394	0.805	1.37	1.09	0.858	0.157	0.252
Cfs	4.64	3.88	2.26	5.14	4.66	0.610	1.25	2.12	1.69	1.33	0.243	0.390
Ac-ft	285	239	135	316	277	37	77	118	104	79	15	23

Calendar Year 1964: Max - Min - Mean mgd - Mean cfs - Ac-ft -
Fiscal Year 1964-65: Max 10.6 Min 0 Mean mgd 1.52 Mean cfs 2.35 Ac-ft 1,700

* Discharge measurement or observation of no flow made on this day.

7331. Lower Hamakua ditch below main weir, near Kukuihaele

Location.--Lat 20°07'07", long 155°35'09", on left bank 30 ft upstream from main weir, 0.8 mile west of Kukuihaele School, and 1.0 mile northeast of Waipio.

Records available.--February 1964 to June 1965.

Gage.--Water-stage recorder and sharp-crested weir. Altitude of gage is 990 ft (from topographic map).

Extremes.--1964-65: Maximum daily discharge, 44.3 mgd (68.5 cfs) Mar. 2, 1964; minimum daily, 6.05 mgd (9.36 cfs) Nov. 21, 1964.

Remarks.--Records good except those for periods of fragmentary gage-height record, which are fair, and those for periods of no gage-height record, which are poor. At high flow water can be diverted from the ditch 1/8 mile upstream and at the gage to prevent flume damage downstream.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	36.2	37.9	32.2	*f29.0	40.6	28	25.5	31	26.9	26.2	25.5	30.6
2	38.8	41.5	34.6	f32.8	38.8	*28	25.5	27	33.0	25.5	32.2	*37.0
3	35.4	37.0	29.8	f37.1	37.9	29	25.5	36	39.7	25	34.6	33.0
4	36.2	36.2	33.8	f33.0	37.0	f29.8	25.5	28	*37.9	30	34.6	26.9
5	40.6	35.4	36.2	39.5	37.9	27.6	25.5	27	36.2	40	29.8	30.6
6	37.0	32.2	34.6	37.9	*38.8	26.9	24.8	26	37.0	39	*29.0	37.0
7	31.4	31.4	37.0	38.8	37.9	26.9	*24.8	25	37.0	*f38.8	31.4	34.6
8	28.3	38.8	34.6	35.4	35.4	26.9	24.8	25	34.6	39.7	33.0	32.2
9	27.6	37.0	35.4	32.2	36.2	29.8	24.8	*f24.1	35.4	38.8	30.6	25.5
10	26.9	37.0	33.8	33.0	38.8	33.0	25.5	23.4	29.8	34.6	29.8	24.1
11	32.2	37.0	33.8	34.6	37.9	35.4	26.2	22.7	28.3	29.8	25.5	26.2
12	39.7	37	32.2	29.0	36.2	33.0	24.1	22.0	30.6	27.6	24.1	34.6
13	36.2	36	36.2	28.3	37.0	27.6	24.1	21.4	28.3	26.9	23.4	26.2
14	35.4	35	39.7	28.3	36.2	32.2	23.4	24.1	27.6	25.5	23.4	24.1
15	37.0	35	33.8	f29.8	33.8	29.8	23.4	26.9	33	25.5	23.4	23.4
16	34.6	35	37.0	f40.6	33.0	29.0	22.7	29.0	38	24.8	23.4	23.4
17	33.0	37	37.9	f38.8	31.4	35.4	22.7	35.4	29	24.1	22.7	22.7
18	f33.0	36	36.2	f29.8	30.6	29.8	22.0	29.8	27	24.1	22.7	22.7
19	f39.7	32.2	37.0	f36.4	35.4	32.2	22.0	35.4	26	24.8	22.0	24.1
20	f37.0	29.0	35.4	38.8	35.4	33.8	22.0	35.4	26	24.8	22.0	28.3
21	38.8	28.3	39.7	39.7	6.05	28.3	22.7	35.4	25	24.1	22.0	32.2
22	37.9	28.3	36.2	37.0	10.1	27.6	36.2	35.4	27	24.1	22.0	25.5
23	40.6	27.6	29.8	37.9	29.8	26.9	37.0	30.6	34	24.1	22.0	24.1
24	37.0	26.9	28.3	36.2	27.6	26.9	34.6	28.3	35	24.1	22.0	23.4
25	37.9	26.9	29.8	f37.9	29.0	26.2	31.4	36.2	38	24.1	22.7	22.0
26	36.2	*26.9	30	37.9	29.0	26.2	32.2	33.0	34	24.1	26.2	21.4
27	*33.0	26.9	30	37.0	28.3	26.2	28.3	37.9	29	23.4	24.8	21.4
28	37.0	31.4	37	37.9	28.3	25.5	26.2	29.8	28	24.1	22.7	25.5
29	37.9	30.6	35	35.4	27.6	25.5	26.9	---------	27	23.4	27.6	26.9
30	38.8	33.0	32	33.0	f27.6	25.5	27.6	---------	28	23.4	30.6	23.4
31	35.4	37.0	---------	35.4	---------	25.5	f35.4	---------	f26.5	---------	23.4	---------
Total	1106.7	1037.4	1029.0	1088.4	969.55	894.4	823.3	821.2	972.8	834.4	809.1	813.0
Mean												
Mgd	35.7	33.5	34.3	35.1	32.3	28.9	26.6	29.3	31.4	27.8	26.1	27.1
Cfs	55.2	51.8	53.1	54.3	50.0	44.7	41.2	45.3	48.6	43.0	40.4	41.9
Ac-ft	3400	3180	3160	3340	2980	2740	2530	2520	2990	2560	2480	2500

Calendar Year 1964: Max - Min - Mean mgd - Mean cfs - Ac-ft -
Fiscal Year 1964-65: Max 41.5 Min 6.05 Mean mgd 30.7 Mean cfs 47.5 Ac-ft 34400

* Discharge measurement made on this day.
f Fragmentary gage-height record.
Note.--No gage-height record Aug. 12-18, Sept. 26-30, Dec. 1-3, Feb. 1-8, Mar. 15-31, Apr. 3-6.

7332. Honokaa diversion at Honokaa

Location.--Lat 20°05'12", long 155°28'36", on left bank 50 ft downstream from Lower Hamakua ditch and 0.5 mile northwest of Honokaa Hospital.

Records available.--March 1964 to June 1965.

Gage.--Water-stage recorder and sharp-crested weir. Altitude of gage is 950 ft (from topographic map).

Extremes.--1964-65: Maximum daily discharge, 15.1 mgd (23.4 cfs) Apr. 25, 1964; minimum daily, 0.83 mgd (1.28 cfs) Nov. 22, 1964.

Remarks.--Records good. The diversion is from Lower Hamakua ditch for use in Honokaa Sugar Co. mill.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	9.44	9.31	9.44	8.98	11.2	9.76	9.76	9.78	10.2	8.85	9.18	8.27
2	10.8	8.60	9.44	8.85	11.6	9.76	9.76	9.62	10.0	8.85	9.76	9.51
3	11.9	9.76	8.98	9.76	11.9	9.31	9.57	12.2	11.6	8.32	11.2	*9.89
4	11.9	10.5	8.85	9.76	11.7	8.85	9.76	10.8	12.2	8.36	10.7	8.27
5	11.9	10.3	9.31	10.6	11.7	8.85	9.18	9.76	12.2	11.4	9.89	7.89
6	10.8	9.57	9.18	11.9	12.2	8.85	8.98	9.76	11.1	13.3	8.98	9.76
7	9.44	9.18	9.31	12.5	12.3	8.85	8.85	9.76	10.2	*14.1	9.44	10.3
8	8.60	9.89	8.98	12.5	12.3	8.73	8.85	9.76	11.2	14.1	9.76	10.0
9	8.14	10.2	10.5	12.0	12.3	8.73	8.64	9.18	12.0	14.0	9.57	8.40
10	8.01	10.3	11.1	11.3	12.3	9.57	8.01	8.85	11.2	12.2	10.9	7.89
11	8.01	10.3	10.9	10.5	12.2	9.89	8.72	8.85	10.8	10.0	10.5	7.89
12	8.60	10.3	9.08	10.6	11.9	10.0	8.85	8.85	10.3	10.0	8.98	10.5
13	8.85	10.2	7.30	10.1	12.2	9.44	8.98	8.85	9.72	10.0	8.85	9.69
14	9.18	10.2	9.08	10.0	11.9	10.0	9.18	8.98	8.98	9.89	8.85	8.85
15	9.89	10.2	9.76	10.0	11.7	10.2	8.98	9.33	9.82	9.89	8.85	8.14
16	9.89	10.0	9.58	12.0	10.9	10.2	8.98	11.9	10.9	9.18	8.85	7.89
17	9.18	10.3	10.9	13.4	10.2	10.2	8.98	12.5	10.0	8.40	8.27	7.89
18	9.31	10.2	11.7	9.45	10.2	9.89	8.98	12.0	10.0	8.27	8.01	7.76
19	10.0	9.44	12.2	11.3	10.3	10.0	8.85	12.3	9.89	8.40	8.01	7.17
20	10.2	8.98	10.9	12.5	10.3	10.5	8.85	11.7	9.58	8.85	8.01	6.97
21	10.2	9.18	12.0	12.3	4.49	10.0	8.85	12.0	8.01	9.18	8.01	8.60
22	9.57	8.14	12.8	12.7	.83	9.89	9.64	11.7	8.81	9.18	8.01	8.21
23	9.18	7.17	12.0	12.5	9.57	9.89	6.66	11.6	11.7	9.18	8.01	8.85
24	8.98	7.56	11.2	10.6	9.76	9.89	8.69	10.9	12.8	9.18	8.01	8.85
25	8.27	8.14	10.3	11.6	9.31	9.76	11.5	11.9	13.1	8.60	8.01	8.73
26	7.43	8.14	10.2	11.7	9.31	9.76	10.9	12.0	12.8	8.60	8.14	7.46
27	8.27	8.14	10.2	12.0	9.31	9.76	10.8	11.7	11.4	8.98	8.14	6.66
28	9.31	8.27	10.7	12.8	9.31	9.76	10.0	11.1	8.14	8.85	8.01	8.01
29	9.89	8.36	10.2	11.8	9.44	9.76	9.18	---------	9.20	8.85	7.27	8.14
30	9.89	8.27	9.89	10.9	9.76	9.76	8.98	---------	9.89	8.85	7.40	8.01
31	9.89	9.76	---------	10.9	---------	9.76	9.31	---------	9.18	---------	7.89	---------
Total	294.92	288.86	305.98	347.80	312.39	299.57	285.22	297.63	326.92	295.81	273.46	254.45
Mean												
Mgd	9.51	9.32	10.2	11.2	10.4	9.66	9.20	10.6	10.5	9.86	8.82	8.48
Cfs	14.7	14.4	15.8	17.3	16.1	14.9	14.2	16.4	16.2	15.3	13.6	13.1
Ac-ft	905	886	939	1,070	959	919	875	913	1,000	908	839	781

Calendar Year 1964:	Max	-	Min	-	Mean mgd	-	Mean cfs	-	Ac-ft	-
Fiscal Year 1964-65:	Max	14.1	Min	0.83	Mean mgd	9.82	Mean cfs	15.2	Ac-ft	10,930

* Discharge measurement made on this day.

7333. Lower Hamakua ditch below Honokaa diversion, at Honokaa

Location.--Lat 20°05'12", long 155°28'34", on right bank 50 ft downstream from tunnel, 100 ft downstream from Honokaa diversion, and 0.5 mile northwest of Honokaa Hospital.

Records available.--February 1964 to June 1965.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 950 ft (from topographic map).

Extremes.--1964-65: Maximum daily discharge, 24.9 mgd (38.5 cfs) Jan. 23, 1965; minimum daily, 0.52 mgd (0.80 cfs) Nov. 22, 1964.

Remarks.--Records good. Excess water is spilled at wasteway 8½ miles above station (see p. 159) and water for Honokaa Sugar Co. mill is diverted 100 ft above station (see preceding page).

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	15.7	18.5	14.8	*15.0	20.7	14.1	11.6	15.2	13.0	13.2	11.1	14.2
2	17.3	21.7	17.5	15.4	19.7	13.9	11.4	13.7	15.9	13.0	16.9	20.1
3	15.4	20.5	15.0	20.5	19.7	15.6	11.3	16.1	*22.2	13.2	18.1	*18.5
4	16.7	17.5	14.2	17.7	19.1	*15.7	10.9	13.3	20.1	16.6	*18.5	14.2
5	17.9	16.7	18.7	21.3	19.1	14.6	11.4	12.6	17.9	17.4	16.1	15.3
6	18.1	15.7	16.1	18.7	*20.5	14.1	11.4	11.8	18.8	14.1	14.6	20.1
7	13.9	14.4	19.3	18.9	20.9	13.7	*11.3	11.1	20.3	*19.1	16.9	17.7
8	12.8	19.3	16.7	16.9	20.7	13.5	11.3	10.8	16.3	19.3	18.5	18.1
9	12.6	21.1	18.1	15.7	19.5	14.6	11.4	11.1	17.7	20.1	15.6	14.2
10	12.1	19.7	16.5	15.2	20.9	18.1	12.3	*11.1	14.6	18.5	16.5	12.8
11	12.0	19.1	15.4	18.1	21.3	19.1	13.2	12.1	13.9	17.3	12.5	13.5
12	19.1	18.9	14.4	14.2	19.5	21.2	11.1	11.3	15.0	15.7	12.8	19.5
13	18.5	17.9	18.3	13.5	19.5	14.1	10.8	10.9	14.8	14.6	12.5	14.4
14	15.4	17.1	19.9	13.3	19.1	18.1	10.9	11.6	15.2	14.1	11.8	13.0
15	18.3	17.3	18.1	13.9	17.5	15.7	10.3	16.3	16.8	13.3	12.0	12.6
16	15.9	17.3	*19.1	17.7	17.5	15.0	10.1	15.9	17.3	13.2	12.1	12.6
17	14.1	18.9	20.1	18.9	17.7	18.7	9.98	17.9	14.2	13.7	11.8	12.5
18	14.1	18.1	19.3	16.1	17.1	16.7	9.66	14.2	13.0	13.3	11.3	11.6
19	17.9	15.9	20.5	18.7	19.7	15.6	9.05	17.7	12.3	13.3	11.3	12.8
20	17.9	14.2	20.1	18.7	19.5	18.9	9.35	18.7	12.2	13.2	11.6	13.3
21	17.9	12.8	19.9	19.7	*7.18	14.4	9.66	17.9	13.5	12.1	11.3	17.0
22	17.7	13.0	19.7	18.7	.52	13.7	18.5	17.9	13.9	11.8	10.8	12.6
23	19.1	14.4	15.6	18.9	12.6	12.8	24.9	15.6	17.5	11.4	10.6	10.9
24	19.5	13.5	14.6	17.9	15.1	12.6	20.7	14.1	17.6	11.3	10.5	10.3
25	18.9	11.4	15.6	18.7	15.4	12.5	15.0	17.1	18.5	11.6	10.9	9.50
26	19.1	*11.4	16.3	18.7	15.0	12.5	16.1	15.7	16.4	11.6	13.0	9.82
27	17.3	11.3	16.1	18.3	14.8	12.3	14.2	18.5	14.3	10.9	13.5	9.82
28	*17.1	11.8	21.7	18.1	14.4	12.0	12.3	15.0	15.7	11.1	11.8	10.9
29	17.5	15.0	20.1	17.5	14.2	12.0	13.3	---------	14.0	11.1	12.3	13.0
30	19.5	14.1	17.9	16.7	13.9	11.8	13.9	---------	14.1	10.9	18.1	10.9
31	18.3	18.1	---------	17.5	---------	11.8	19.1	---------	13.3	---------	12.6	---------
Total	517.6	506.6	529.6	539.1	512.30	459.4	396.40	405.2	490.3	420.0	417.9	415.74
Mean												
Mgd	16.7	16.3	17.7	17.4	17.1	14.8	12.8	14.5	15.8	14.0	13.5	13.9
Cfs	25.8	25.2	27.4	26.9	26.5	22.9	19.8	22.4	24.4	21.7	20.9	21.5
Ac-ft	1590	1550	1630	1650	1570	1410	1220	1240	1500	1290	1280	1280

Calendar Year 1964:	Max	-	Min	-	Mean mgd	-	Mean cfs	-	Ac-ft	-		
Fiscal Year 1964-65:	Max	24.9	Min	0.52	Mean mgd	15.4	Mean cfs	23.8	Ac-ft	17.210		

* Discharge measurement made on this day.

7420. Kukui Stream near Waimanu

Location.--Lat 20°09'14", long 155°40'15", on left bank 300 ft upstream from Waimanu trail crossing, 0.4 mile east of head of Awini ditch, and 2.2 miles west of Waimanu.

Drainage area.--0.21 sq mi.

Records available.--February 1939 to July 1952, September 1959 to June 1965.

Gage.--Water-stage recorder. Altitude of gage is 1,940 ft (by barometer).

Average discharge.--18 years (1939-52, 1960-65), 1.25 mgd (1.93 cfs).

Extremes.--Maximum discharge during year, 157 mgd (243 cfs) Oct. 19 (gage height, 3.98 ft), from rating curve extended above 9.0 mgd by logarithmic plotting; minimum, 0.17 mgd (0.26 cfs) June 29, 30.
1939-52, 1959-65: Maximum discharge, 195 mgd (302 cfs) Feb. 25, 1962 (gage height, 4.45 ft), from rating curve extended above 2.4 mgd by test on model of station site; minimum, 0.11 mgd (0.17 cfs) Sept. 6-8, 1961.

Remarks.--Records fair except those above 20 mgd, which are poor.

Rating tables (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used Apr. 6-22)

July 1 to Apr. 5				Apr. 6 to June 30			
0.1	0.10	0.7	3.00	0.1	0.12	0.7	3.00
.2	.30	1.0	6.60	.2	.35	1.0	6.60
.3	.60	1.5	16.5	.3	.68	1.4	14.0
.5	1.50	2.1	36.0	.5	1.60		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.38	0.83	0.39	0.42	1.45	0.54	0.33	0.54	1.88	0.42	0.35	0.82
2	1.71	6.09	.75	.48	3.03	.68	.30	1.26	5.36	.42	2.82	2.87
3	.60	1.05	.33	.64	16.9	.92	.30	1.47	17.7	.39	.55	.94
4	.51	.68	.42	1.49	1.20	.72	.30	.54	3.79	6.90	.65	.30
5	2.20	.64	.42	4.43	5.23	.51	.30	.45	*1.60	16.7	.48	.35
6	.51	.51	.36	.76	8.75	.45	.28	.39	.92	12.1	.35	1.89
7	.42	.51	1.38	1.74	7.72	.45	.28	.36	.72	1.66	.35	.52
8	.36	1.61	.68	*.51	14.7	.48	.26	.33	3.95	1.82	.52	.35
9	*.36	4.25	.76	.45	5.34	1.47	.24	.30	.92	1.35	.38	.28
10	.36	.80	.57	.45	4.12	7.68	.28	.30	2.67	.81	.30	.26
11	.57	2.48	.57	.42	4.00	3.90	.24	2.84	1.00	.68	.28	1.05
12	2.03	2.93	.57	.39	2.44	15.2	.22	.45	.72	.61	.28	.72
13	.60	.96	2.21	.36	1.15	1.35	.22	.36	.60	.58	.26	.30
14	1.96	.64	.76	.36	.96	1.00	*.24	1.85	.84	.55	.26	.26
15	3.96	.57	.51	.45	.84	.76	.22	3.36	3.54	.52	.28	.24
16	.51	.64	2.07	1.57	.76	.72	.22	8.20	.80	.48	.26	.24
17	.45	.57	8.70	.57	.68	2.12	.20	6.38	.57	.45	.26	*.21
18	.42	1.08	2.09	.36	.68	.60	.20	.88	.51	.45	.26	.24
19	.76	.48	.72	33.7	2.85	1.38	.20	1.12	.48	.65	.26	.21
20	2.11	*.39	1.34	9.17	*2.36	.64	.20	3.15	.45	.89	.24	.24
21	4.32	.39	3.92	15.0	1.00	.51	7.06	.76	.42	.45	.21	.21
22	.88	.42	.88	7.62	.80	.48	12.8	.76	.78	*.36	.21	.21
23	1.64	.39	.57	10.5	.76	.42	8.83	.57	.57	.33	.21	.21
24	1.11	.36	.54	2.84	.72	.42	1.93	.57	6.04	.33	.21	.19
25	.80	.36	.57	4.12	.68	.36	2.11	3.14	10.6	.33	.45	.19
26	.60	.33	.51	9.99	.64	.36	1.39	1.13	.92	.33	.52	.19
27	.51	.33	.45	3.76	.57	.36	1.10	1.34	.68	.33	.28	.21
28	.60	.30	1.10	1.45	.57	.33	.68	.72	.54	.33	.21	.24
29	.68	.30	2.17	1.25	.54	.33	.85	---------	.51	.30	.28	.19
30	5.26	.45	.45	1.41	.54	.33	1.34	---------	.51	.30	.30	.19
31	.76	3.29	---------	1.40	---------	.33	1.53	---------	.45	---------	.21	---------
Total	39.94	34.63	36.76	118.06	91.98	45.80	44.65	43.52	71.04	51.82	12.48	14.32
Mean												
Mgd	1.29	1.12	1.23	3.81	3.07	1.48	1.44	1.55	2.29	1.73	0.403	0.477
Cfs	2.00	1.73	1.90	5.89	4.75	2.29	2.23	2.40	3.54	2.68	0.624	0.738
Ac-ft	123	106	113	362	282	141	137	134	218	159	38	44

Calendar Year 1964:	Max	33.7	Min	0.26	Mean mgd	1.60	Mean cfs	2.48	Ac-ft	1,790	
Fiscal Year 1964-65:	Max	33.7	Min	0.19	Mean mgd	1.66	Mean cfs	2.57	Ac-ft	1,860	

* Discharge measurement made on this day.

Peak discharge (base, 50 mgd, revised)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
9-17	2230	2.60	59.0	91.3	12-10	1800	3.68	132	204
10-19	0730	3.98	157	243	1-21	2030	2.83	72.8	113
10-23	1100	2.48	53.0	82.0	2-16	1930	3.27	102	158
11- 3	0300	3.46	115	178	3- 3	0700	2.78	69.8	108
11- 8	0100	2.79	70.4	109	4- 5	1500	3.70	134	207

7430. Awini ditch at East Honokane Iki Gulch, near Niulii

Location.--Lat 20°09'55", long 155°43'10", at upper end of flume across East Honokane Iki Gulch and 4.5 miles southeast of Niulii.

Records available.--October 1927 to June 1938, September 1938 to June 1949, July 1950 to June 1965.

Gage.--Water-stage recorder. Altitude of gage is 2,000 ft (from topographic map).

Average discharge.--35 years (1928-38, 1939-49, 1950-65), 11.7 mgd (18.1 cfs).

Extremes.--1927-65: Maximum daily discharge, 33 mgd (51 cfs) Jan. 8, 1935, Aug. 10, 1938; no flow at times.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Ditch diverts at altitude 2,000 ft from all streams between the Waikaloa and the Honokane for irrigation in vicinity of Kohala.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	a15	13.7	11.7	9.26	18.5	6.20	3.80	10.3	5.70	4.20	2.30	7.81
2	a20	23.7	15.7	11.1	16.7	8.25	3.24	1.65	21.5	3.96	5.15	23.3
3	a16	18.4	9.94	17.6	20.2	12.6	2.88	1.23	26.4	3.96	9.58	15.8
4	a18	15.0	8.49	17.2	13.8	12.6	2.64	.43	*18.2	6.46	9.70	6.30
5	a21	13.4	12.6	24.4	19.7	8.05	2.52	.30	11.9	21.9	7.72	8.43
6	a17	10.7	10.7	18.6	24.1	6.20	2.46	.22	12.2	16.4	4.52	20.9
7	a11	8.82	19.1	*21.3	20.8	5.32	2.35	.18	10.9	11.0	7.43	14.2
8	*a8.0	20.0	16.4	14.8	21.1	5.05	2.25	.16	11.0	11.0	14.0	10.8
9	6.50	22.9	18.9	11.6	17.8	12.6	2.15	.14	12.8	11.5	8.60	6.20
10	5.60	17.6	15.4	9.82	a15	17.4	5.23	.59	8.27	6.20	4.87	3.96
11	6.87	18.5	15.0	10.3	a12	18.7	6.70	6.96	8.39	4.60	3.24	9.71
12	15.9	21.5	14.2	8.05	a18	20.0	3.32	2.30	8.83	3.96	2.52	17.2
13	16.6	17.4	17.0	6.70	a16	6.87	2.58	2.19	7.30	3.48	2.20	7.83
14	18.8	13.5	18.6	6.10	a14	7.06	2.35	9.92	7.88	3.24	2.00	4.69
15	22.4	10.4	13.2	8.98	a13	3.88	*2.30	16.1	14.7	2.94	1.95	3.40
16	13.8	10.8	18.5	17.8	a12	4.20	2.05	21.3	11.8	2.70	2.10	2.88
17	11.8	14.1	21.1	16.4	a11	15.6	1.80	20.0	7.40	2.58	1.70	2.52
18	10.7	16.0	22.0	9.37	a11	8.49	1.65	9.04	5.90	2.46	1.60	*2.25
19	18.3	*11.3	14.9	23.7	*a20	12.0	1.55	12.3	5.05	2.76	1.65	2.20
20	20.0	8.38	17.0	22.7	12.2	11.9	1.50	17.4	4.52	3.56	1.50	2.30
21	22.7	6.90	19.0	26.0	13.4	6.70	3.62	10.9	3.80	*2.52	1.45	5.50
22	18.0	6.60	17.8	23.6	9.70	5.32	23.6	8.49	6.36	2.46	1.36	3.32
23	20.1	5.90	11.7	21.0	8.49	4.69	23.0	7.10	10.4	2.64	1.32	2.58
24	17.9	5.32	9.15	15.2	7.72	4.28	14.4	7.37	11.1	2.46	1.28	2.15
25	13.8	4.78	9.85	18.4	7.30	4.12	8.03	19.1	22.4	2.30	1.52	1.80
26	11.7	4.44	9.04	21.0	7.30	3.96	13.6	11.3	10.2	2.25	6.00	1.60
27	9.82	4.20	9.59	17.4	7.00	3.96	9.38	11.7	7.72	2.20	4.28	1.60
28	17.0	3.96	20.9	12.2	6.80	3.64	9.26	8.49	6.30	2.20	2.70	5.80
29	17.8	3.88	21.3	14.8	6.20	3.40	9.00	---------	5.41	2.20	3.45	6.60
30	22.7	6.89	11.9	13.1	5.90	3.32	11.9	---------	5.14	2.15	8.50	3.72
31	16.1	20.7	---------	16.6	---------	3.88	21.2	---------	4.60	---------	3.16	---------
Total	480.89	379.67	450.66	485.08	406.71	250.24	202.31	217.16	314.07	152.24	129.35	207.35
Mean												
Mgd	15.5	12.2	15.0	15.6	13.6	8.07	6.53	7.76	10.1	5.07	4.17	6.91
Cfs	24.0	18.9	23.2	24.1	21.0	12.5	10.1	12.0	15.6	7.84	6.45	10.7
Ac-ft	1480	1170	1380	1490	1250	768	621	666	964	467	397	636

Calendar Year 1964:	Max	26.6	Min	0.97	Mean mgd	12.3	Mean cfs	19.0	Ac-ft	13,860		
Fiscal Year 1964-65:	Max	26.4	Min	0.14	Mean mgd	10.1	Mean cfs	15.6	Ac-ft	11,290		

* Discharge measurement made on this day.
a No gage-height record.

7440. East Honokane Iki intake to Awini ditch near Niulii

Location.--Lat 20°09'55", long 155°43'15", on intake tunnel delivering water from East Honokane Iki Gulch to Awini ditch, on west side of gulch, and 4.5 miles southeast of Niulii.

Records available.--October 1927 to May 1928, July 1928 to December 1936, July 1937 to June 1938, July 1939 to July 1940, September 1940 to June 1949, July 1951 to June 1965. Prior to July 1962, published as "at East Honokane Iki Gulch, near Niulii."

Gage.--Water-stage recorder and sharp-crested weir. Altitude of gage is 2,000 ft (from topographic map).

Average discharge.--32 years (1928-36, 1937-38, 1939-40, 1941-49, 1951-65), 1.17 mgd (1.81 cfs).

Extremes.--1927-49, 1951-65: Maximum daily discharge, 8.4 mgd (13.0 cfs) Aug. 6, 1957; no flow at times.

Remarks.--Records fair except those for periods of no gage-height record, which are poor.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.77	0.87	0.64	0.41	1.94	0.23	0.23	0.4	0.4	0.29	0.08	0.92
2	2.87	5.98	1.29	.94	1.59	.32	.17	.5	2.0	.26	.10	4.46
3	1.12	2.28	.44	1.79	1.45	.52	.12	.7	5.0	.23	.48	1.72
4	1.95	1.01	.29	2.74	1.58	.44	.12	.4	*3.0	1.33	.64	.32
5	3.43	.68	.29	5.98	5.61	.29	.10	.3	3.11	3.38	.56	.66
6	1.16	.52	.26	1.94	5.77	.20	.10	.2	2.13	1.49	.20	3.82
7	.38	.48	2.70	*3.29	3.26	.17	.08	.2	1.16	.79	.45	1.40
8	*.29	3.52	1.59	.75	1.37	.17	.08	.1	1.87	.87	2.10	.64
9	.26	5.21	2.46	.44	.75	1.53	.08	.1	1.71	.71	.71	.26
10	.23	1.80	1.13	.38	.79	2.24	.67	.1	.71	.52	.23	.14
11	.23	2.48	.83	.35	.64	4.56	.48	.5	.56	.48	.12	1.86
12	1.81	4.05	.75	.29	3.27	3.28	.17	.2	1.30	.48	.08	2.48
13	1.98	1.75	2.18	.26	2.07	.26	.10	.2	.56	.44	.06	.41
14	4.57	.83	2.16	.23	1.30	.91	.08	.6	.77	.41	.06	.20
15	4.88	.52	.56	.56	.97	.83	*.06	1.5	3.06	.35	.06	.12
16	.92	1.04	2.77	2.56	.79	.64	.06	3.5	.97	.29	.08	.08
17	.64	1.01	3.78	1.38	.64	2.96	.04	2.5	.41	.26	.06	.06
18	.44	1.71	3.18	.41	.60	.64	.04	.6	.29	.26	.04	*.04
19	3.22	*.52	1.11	1.00	*3.72	2.26	.04	1.0	.26	.26	.04	.03
20	3.32	.35	1.65	5.04	1.25	1.06	.03	2.0	.23	.26	.03	.03
21	4.82	.29	3.13	8.18	1.40	.44	.2	1.0	.20	*.17	.03	.06
22	2.06	.29	1.82	6.35	.60	.35	4.0	.6	1.21	.17	.02	.06
23	3.18	.26	.64	4.89	.56	.29	2.0	.5	1.64	.13	.01	.04
24	2.22	.23	.44	2.50	.44	.26	1.0	.5	2.55	.12	.01	.03
25	.79	.20	.48	2.89	.38	.26	.8	2.0	4.43	.10	.01	.02
26	.60	.17	.44	3.57	.35	.23	1.5	1.0	1.40	.08	.03	.02
27	.56	.17	.44	2.44	.32	.23	.8	1.2	.83	.08	.03	.02
28	2.34	.14	4.05	1.50	.29	.20	.5	.6	.56	.10	.03	.28
29	2.93	.14	4.14	1.11	.26	.17	.7	---------	.44	.08	.14	.32
30	5.92	.30	.68	1.01	.23	.14	1.3	---------	.38	.10	.52	.08
31	1.35	4.26	---------	1.30	---------	.23	3.0	---------	.32	---------	.12	---------
Total	62.24	43.06	46.32	66.48	44.19	26.31	18.65	23.0	43.46	14.49	7.13	20.58
Mean												
Mgd	2.01	1.39	1.54	2.14	1.47	0.849	0.602	0.82	1.40	0.483	0.230	0.686
Cfs	3.11	2.15	2.38	3.31	2.27	1.31	0.931	1.27	2.17	0.747	0.356	1.06
Ac-ft	191	132	142	204	136	81	57	71	133	44	22	63

Calendar Year 1964:	Max	8.18	Min	0.12	Mean mgd	1.66	Mean cfs	2.57	Ac-ft	1870
Fiscal Year 1964-65:	Max	8.18	Min	0.01	Mean mgd	1.14	Mean cfs	1.76	Ac-ft	1280

* Discharge measurement made on this day.

Note.--No gage-height record Jan. 21 to Mar. 4, June 26, 27.

7455. Awini ditch at Awini weir, near Kohala

Location.--Lat 20°08'20", long 155°43'55", on right bank at Awini weir, 6 miles south of Niulii, and 8 miles southeast of Kohala.

Records available.--July 1907 to June 1917 (published as Kohala ditch at Awini weir, near Kohala), May 1963 to June 1965.

Gage.--Water-stage recorder (digital prior to Jan. 13) and sharp-crested weir. Altitude of gage is 1,840 ft (from topographic map). July 1, 1907, to June 30, 1917, staff gage at same site at different datum.

Average discharge.--12 years, 12.7 mgd (19.6 cfs).

Extremes.--1907-17, 1963-65: Maximum daily discharge, 36 mgd (56 cfs) May 20, 24, 1964; no flow July 11, 12, 16, Dec. 16-26, 1907, June 2, Oct. 29 to Nov. 2, 1913.

Remarks.--Records fair except those for periods of no gage-height record, which are poor. Ditch diverts at altitude 2,000 ft from all streams between the Waikaloa and the Honokane and empties into Kohala ditch (see p. 168) for irrigation in vicinity of Kohala.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	17.0	15	13	9.40	24	7.0	4.0	13.4	5.57	3.33	2.3	9.0
2	25.7	33	20	10.9	21	9.0	3.5	8.53	25.3	3.33	6.0	32
3	18.7	23	11	21.8	27	15	3.0	10.5	33.0	3.50	10	20
4	21.5	18	9.0	21	16	15	2.7	2.14	*27.4	4.73	11	7.0
5	26.8	15	15	34	26	9.0	2.5	.84	19.8	27.1	9.0	10
6	19.8	12	12	24	32	7.0	2.3	.36	17.3	20	5.0	28
7	12.7	10	25	*28	26	6.0	2.2	.30	13.3	13	8.0	17
8	*7.96	25	21	16.2	27	5.5	2.1	.42	14.5	13	17	13
9	5.80	31	25	11.8	22	15	2.0	.42	15.6	14	10	7.0
10	4.88	21	19	9.40	18	23	6.0	.48	9.10	7.0	6.0	4.5
11	5.57	23	18	10.0	14	25	8.0	5.18	8.23	5.0	3.5	11
12	17.0	28	17	7.15	24	27	3.0	1.20	12.1	4.5	2.5	22
13	20.1	22	21	5.80	20	8.0	*1.6	.36	7.96	4.0	2.1	9.0
14	24.3	15	24	4.88	17	8.0	1.44	6.84	8.50	3.5	1.9	6.0
15	31.0	11	16	7.96	15	4.0	1.44	20.2	19.6	3.0	1.8	4.0
16	16.2	12	24	19.8	14	4.5	1.20	25.7	13.0	2.8	2.2	*2.62
17	13.0	17	28	18.4	13	19	.96	27.1	7.69	2.5	1.5	2.43
18	11.5	22	29.9	8.80	13	10	.72	11.2	5.80	2.5	1.4	1.86
19	24.7	*13	18.0	34.4	*27	14	.60	15.9	5.11	2.8	1.4	1.67
20	27	10	20.8	32.4	14	14	.60	22.2	4.19	4.0	1.3	1.86
21	30	8.0	23.2	35.2	16	8.0	3.95	13.0	3.73	*3.0	1.2	5.44
22	22	7.0	22.6	33.0	11	6.0	32	9.10	7.47	2.7	1.1	3.60
23	27	6.0	13.3	31.3	10	5.0	31	6.88	12.7	3.0	1.1	2.81
24	22	5.0	9.40	23.2	9.0	4.5	21.7	6.70	14.3	2.7	1.1	2.62
25	16	4.5	9.70	27.1	8.0	4.0	10.5	25.6	29.6	2.5	1.3	2.43
26	13	4.0	9.10	31.7	8.0	4.0	21.4	14.5	13.3	2.2	7.0	2.05
27	11	3.6	9.10	22	7.5	4.0	11.8	15.2	9.10	2.1	5.0	1.67
28	20	3.4	26.8	14	7.5	3.5	10.9	10.3	6.88	2.1	3.0	5.22
29	21	3.2	27.8	18	7.0	3.5	10.0	---------	5.57	2.1	4.0	5.44
30	30	6.0	13.6	15	6.5	3.0	13.4	---------	4.65	2.1	10	4.40
31	20	27	----------	21	----------	4.0	29.6	---------	3.73	----------	4.0	----------
Total	583.21	453.7	551.30	607.59	500.5	294.5	246.11	274.55	384.08	168.09	142.7	245.62
Mean												
Mgd	18.8	14.6	18.4	19.6	16.7	9.50	7.94	9.81	12.4	5.60	4.60	8.19
Cfs	29.1	22.6	28.5	30.3	25.8	14.7	12.3	15.2	19.2	8.66	7.12	12.7
Ac-ft	1,790	1,390	1,690	1,860	1,540	904	755	843	1,180	516	438	754

Calendar Year 1964:	Max	36	Min	1.68	Mean mgd	15.6	Mean cfs	24.1	Ac-ft	17,500
Fiscal Year 1964-65:	Max	35.2	Min	0.30	Mean mgd	12.2	Mean cfs	18.9	Ac-ft	13,660

* Discharge measurement made on this day.

Note.--No gage-height record July 20 to Sept. 17, Oct. 4-7, Oct. 27 to Jan. 13, Jan. 22, 23, Apr. 6 to June 15.

7475. East Branch Honokane Nui Stream near Niulii

Location.--Lat 20°08'18", long 155°44'00", on left bank 500 ft upstream from Awini falls, 1.2 miles upstream from confluence with West Branch, and 6.0 miles south of Niulii.

Drainage area.--4.96 sq mi.

Records available.--May 1963 to June 1965.

Gage.--Water-stage recorder. Altitude of gage is 1,080 ft (from topographic map). Prior to Dec. 13, 1964, at datum 1.00 ft higher.

Extremes.--Maximum discharge during year, not determined; maximum daily, 76.6 mgd (119 cfs) Jan. 22; minimum, not determined; minimum daily, 10 mgd (16 cfs) Jan. 7-9, May 22-24.
1963-65: Maximum discharge not determined; maximum daily, that of Jan. 22, 1965; minimum, not determined; minimum daily, 9.80 mgd (15.2 cfs) June 17, Sept. 5, 1963.

Remarks.--Records poor. No diversion above station.

Rating tables (gage height, in feet, and discharge, in million gallons a day)

July 1 to Dec. 12		Dec. 13 to June 30	
0	9.00	0.9	9.00
1.0	39.0	2.5	77.0
1.6	63.0		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	16	15	13.8	14	17.4	11	12	17.8	13	13	12.6	13.8
2	22	55	13.2	12	18.6	11	12	24.6	30	12	13.8	35.8
3	15	25	12.6	14	40	13	12	29.0	70	11	14.2	15
4	18	15	12.0	15	25	12	11	17.0	*30	12	13.0	12
5	19	14	12.0	40	25	11	11	16	20	50	13.4	11
6	14	13	12.0	20	50	11	11	15	15	40	13.0	27.0
7	*12	12	19.2	*25	40	11	10	13	13	15	27.7	21.0
8	11.4	25	17.0	14.7	50	11	10	12	13	15	25.7	15.0
9	11.7	35	22.6	14.1	35	12	10	12	14	15	14.6	13.4
10	11.7	20	15.6	13.8	40	40	12	12	12	14	13.0	13.0
11	12.0	15	15.6	13.8	35	30	13	14	11	13	12.6	18.8
12	12.6	25	14.4	13.5	25	60	*13	13	13	13	12.2	35.0
13	15.9	17	18.6	13.2	15	15	13	13	12	13	12.2	14.6
14	32.3	16	18.6	12.9	14	13	13.0	12	12	12	12.6	13.4
15	41.9	14	12.9	14.1	13	13	13.4	21.0	12	12	12.6	13.0
16	14.1	13	21.9	19.8	13	14	13.4	31.0	11	12	12	*12.6
17	12.6	17	30	18.0	12	16	13.4	59.3	11	12	12	12.6
18	12.0	*17	35	13.8	*12	12	13.4	18.2	12	12	12	13.0
19	33.2	12.9	20	52.0	20	14	13.4	27.0	12	12	12	13.0
20	29.1	12.3	16	38.1	13	13	13.4	30	12	12	11	19.0
21	38.8	12.3	20	52.6	12	13	18.5	15	12	*11.8	11	17.4
22	18.6	12.0	15	37.8	12	13	76.6	13	13	12.2	10	13.8
23	30.6	12.0	14	48.6	12	12	76.5	18	15	12.2	10	13.4
24	25.9	12.0	13	20	12	12	40.0	15	20	12.2	10	13.4
25	14	11.7	12	25	12	12	17.8	40	30	12.2	11	13.0
26	12	11.7	12	39.6	12	12	17.4	20	15	12.6	11	13.0
27	12	11.7	13	32.4	12	12	17.0	15	12	12.6	12	12
28	17	12.6	35	17.7	12	11	16.2	13	11	12.6	12.6	12
29	25	12.0	35	15.3	12	11	21.8	---------	12	12.6	13.0	12
30	55	12.6	15	15.0	12	12	26.0	---------	13	12.6	13.0	12
31	20	32.2	---------	14.7	---------	14	54.0	---------	13	---------	12.6	---------
Total	635.4	541.0	537.0	710.5	633.0	477	625.2	555.9	514	443.6	408.4	474.0
Mean												
Mgd	20.5	17.5	17.9	22.9	21.1	15.4	20.2	19.9	16.6	14.8	13.2	15.8
Cfs	31.7	27.1	27.7	35.4	32.6	23.8	31.3	30.8	25.7	22.9	20.4	24.4
Ac-ft	1950	1660	1650	2180	1940	1460	1920	1710	1580	1360	1250	1450

Calendar Year 1964:	Max	71.0	Min	10	Mean mgd	19.8	Mean cfs	30.6	Ac-ft	22200		
Fiscal Year 1964-65:	Max	76.6	Min	10	Mean mgd	18.0	Mean cfs	27.9	Ac-ft	20110		

* Discharge measurement made on this day.

Note.--No gage-height record July 1-7, July 25 to Aug. 18, Sept. 17 to Oct. 7, Oct. 24, 25, Nov. 3 to Jan. 13, Feb. 5-14, Feb. 20 to Apr. 20, May 16-27, June 3-5, 27-30.

7509. Kohala ditch at Honokane, near Niulii

Location.--Lat 20°09'50", long 155°43'50", on land of Honokane, on Honokane trail at tunnel adit, 28 ft from right side of tunnel, and 4.4 miles south of Niulii.

Records available.--May 1963 to June 1965.

Gage.--Water-stage recorder (digital prior to Apr. 20). Altitude of gage is 960 ft (from topographic map).

Extremes.--1963-65: Maximum daily discharge, 62 mgd (96 cfs) May 24, 1964; no flow at times.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Kohala ditch receives flow of Awini ditch at Honokane Gulch and diverts water at altitude of about 1,000 ft from East and West Branches Honokane Nui Stream. Water is used for irrigation in vicinity of Kohala.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	30	27.1	25.7	22.7	28	19	16	22.5	18.5	16.4	10.3	16
2	38	55.0	28.9	22.3	28	20	15	22.5	*32.7	15.1	12.4	36
3	30	36.8	22.9	31.3	43	25	15	29.9	58.9	14.9	21.0	25
4	34	28.9	19.7	28.9	33	25	14	17.9	27.9	16.4	18.7	16
5	37	26.9	23.7	47.5	37	20	15	15.7	12.9	23.4	18.5	19
6	30	24.1	21.5	*34.0	50	19	15	14.8	12.3	22.4	14.6	33
7	*22	22.3	32.7	37.2	44	18	14	13.1	11.6	17.3	21.7	29
8	19.5	38.5	30.7	29.2	48	18	14	12.4	11.3	18.2	28.2	23
9	18.1	47.0	37.8	25.3	38	25	15	12.3	11.7	19.3	20.9	18
10	17.0	34.2	29.5	22.3	42	38	18	12.5	10.4	16.2	15.7	15
11	17.9	32.1	29.3	22.7	42	38	21	19.2	9.97	10.0	15.0	19
12	27.7	40.2	28.1	20.1	36	35	*16	14.7	12.5	0	13.2	34
13	32.1	33.5	32.9	18.2	25	20	15.1	13.8	11.3	0	12.4	19
14	40.0	28.5	35.0	18	22	21	14.8	18.9	11.0	0	12.7	16
15	47.5	24.3	26.3	20	21	19	14.4	30.9	12.4	0	12.2	*14
16	28.5	24.3	34.2	32	20	20	14.5	32.5	10.1	0	12.1	13.6
17	25.7	30.3	41.8	31	*19	31	14.3	13.6	10.2	0	12.1	13.0
18	24.1	*32	46.5	22	19	21	13.9	6.47	12.7	0	12.1	13.0
19	44.0	25.1	31.3	60	29	26	13.7	11.2	14.0	0	12.1	12.6
20	42.0	20.9	32.3	45	24	22	13.5	8.18	15.6	*0	11.8	14.7
21	49.5	18.7	32.5	56	26	19	17.6	0	15.3	0	11.8	17.2
22	35.2	18.1	32.3	46	23	19	56.3	17.9	17.6	0	11.6	13
23	42.0	17.2	24.9	50	22	18	52.2	22.3	18.0	0	11.3	11
24	38.5	16.4	22.1	35	21	17	33.9	20.7	20.1	0	10.3	11
25	27.5	16.2	21.9	39	20	16	23.5	38.2	24.0	1.68	10.3	10
26	23.7	15.8	21.5	44	20	16	31.2	24.9	18.6	7.40	14.1	10
27	22.7	15.7	21.9	35	19	16	23.9	24.1	17.4	8.77	15	10
28	32.7	15.8	44.5	26	18	15	22.7	21.5	17.0	10.2	13	14
29	38.0	15.6	44.2	26	19	15	24.7	---------	17.3	10.4	13	17
30	54.0	18.3	26.7	24	19	16	27.8	---------	18.0	10.4	17	13
31	31.3	43.0	---------	26	---------	19	45.2	---------	17.0	---------	12	---------
Total	1,000.2	842.8	903.3	996.7	855	666	661.2	512.65	528.27	238.45	447.1	525.1
Mean												
Mgd	32.3	27.2	30.1	32.2	28.5	21.5	21.3	18.3	17.0	7.95	14.4	17.5
Cfs	50.0	42.1	46.6	49.8	44.1	33.3	33.0	28.3	26.3	12.3	22.3	27.1
Ac-ft	3,070	2,590	2,770	3,060	2,620	2,040	2,030	1,570	1,620	732	1,370	1,610

Calendar Year 1964:	Max	62	Min	0	Mean mgd	27.3	Mean cfs	42.2	Ac-ft	30,690		
Fiscal Year 1964-65:	Max	60	Min	0	Mean mgd	22.4	Mean cfs	34.7	Ac-ft	25,080		

* Discharge measurement or observation of no flow made on this day.

Note.--No gage-height record July 1-7, Aug. 18, Oct. 14 to Jan. 12, May 27 to June 15, June 22-30.

7510. Kohala ditch at Pololu, near Niulii

Location.--Lat 20°10'19", long 155°44'20", on right bank of open section of ditch, on land of Pololu, 0.5 mile upstream from Pololu Stream, and 3.7 miles south of Niulii.

Records available.--August 1927 to June 1938, September 1938 to June 1965.

Gage.--Water-stage recorder. Altitude of gage is 960 ft (from topographic map).

Average discharge.--36 years (1928-38, 1939-65), 26.8 mgd (41.5 cfs).

Extremes.--1927-65: Maximum daily discharge, 66.2 mgd (102 cfs) Oct. 19, 1964; no flow at times.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Kohala ditch receives flow of Awini ditch at Honokane Gulch and diverts water at altitude of about 1,000 ft from East and West Branches Honokane Nui Stream and all streams west. Water is used for irrigation in vicinity of Kohala.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	32.9	29.2	28.3	25.2	31.6	21.8	18.4	24.9	21.0	20.0	13.6	18.6
2	42.2	56.4	31.4	24.9	31.6	23.3	17.6	27.1	*35.5	18.8	15.9	38.0
3	32.7	38.7	25.6	33.7	47.7	28.3	17.0	32.0	56.1	18.3	22.7	28.4
4	36.4	31.0	23.1	31.2	35.5	28.3	16.7	21.0	31.2	24.3	21.5	18.4
5	40.4	29.2	26.6	50.2	40.6	22.5	17.0	18.8	16.0	31.8	20.8	21.3
6	33.1	26.7	24.5	*36.6	55.8	21.0	17.5	17.6	15.0	31.6	16.5	35.9
7	*25.6	24.9	35.0	39.2	47.7	20.6	15.9	15.9	13.9	22.0	24.2	31.6
8	22.5	40.2	32.9	31.2	52.5	20.6	16.5	15.2	14.4	23.4	29.0	25.4
9	21.3	50.2	39.9	27.5	41.6	29.6	17.0	15.0	14.5	24.0	22.5	20.1
10	20.1	37.3	32.0	24.7	47.9	42.2	20.0	15.2	12.7	19.8	17.8	17.5
11	21.0	34.4	31.6	24.9	47.9	42.2	23.3	22.4	12.6	13.4	17.2	21.3
12	29.8	42.6	30.4	22.7	39.0	38.7	*18.8	17.6	15.2	a .05	15.1	36.8
13	34.2	36.2	34.8	20.8	28.8	22.7	17.5	16.8	13.8	a .04	14.5	21.7
14	41.4	30.8	37.5	20.1	25.8	23.3	17.3	23.8	13.9	a .04	15.2	18.3
15	50.2	26.9	28.8	22.7	24.3	21.2	17.0	33.3	14.5	a .04	14.2	*16.8
16	30.4	26.7	35.5	35.0	23.1	22.9	17.2	36.4	12.3	a .04	14.5	15.9
17	28.1	32.9	46.0	34.4	*22.4	34.8	16.8	20.5	13.3	a .04	14.6	15.4
18	26.6	*34.2	51.3	24.0	22.2	23.1	16.4	9.47	15.9	a .04	14.6	15.2
19	45.5	27.3	33.5	66.2	32.7	29.2	16.2	15.0	17.3	a .03	14.6	14.8
20	44.2	23.8	34.6	49.9	26.7	25.1	16.0	12.1	18.8	*a .03	14.5	16.7
21	53.1	21.8	34.4	60.3	28.6	21.8	20.8	a .05	18.6	a .03	14.5	20.1
22	37.5	21.3	34.8	50.4	25.4	21.7	55.5	21.5	21.0	a .03	14.4	15.7
23	43.4	20.5	27.3	55.2	24.9	20.5	52.8	23.8	21.3	a .03	14.4	13.6
24	40.9	19.6	24.9	37.8	23.6	19.4	35.7	23.3	26.6	a .03	12.6	13.2
25	29.6	19.3	24.9	42.2	22.9	18.9	26.7	39.4	30.2	a .02	12.8	12.6
26	26.2	18.9	24.5	47.9	22.4	18.4	33.5	26.6	22.5	a .02	17.2	12.3
27	25.4	18.8	24.5	41.6	21.8	18.4	26.4	26.6	21.2	6.16	17.5	12.4
28	34.8	18.9	46.3	29.2	21.5	18.0	25.1	23.6	20.5	13.8	15.7	16.7
29	39.7	18.6	46.8	29.4	21.7	17.8	26.9	---------	21.0	13.8	15.4	19.3
30	54.9	21.5	29.0	27.5	22.0	18.3	29.8	---------	21.7	13.8	20.3	15.2
31	33.1	45.2	---------	29.4	---------	21.3	44.2	---------	20.6	---------	15.1	---------
Total	1.077.2	924.0	980.7	1.096.0	960.2	755.9	727.5	594.92	623.1	295.47	523.4	599.2
Mean												
Mgd	34.7	29.8	32.7	35.4	32.0	24.4	23.5	21.2	20.1	9.85	16.9	20.0
Cfs	53.7	46.1	50.6	54.8	49.5	37.8	36.4	32.8	31.1	15.2	26.1	30.9
Ac-ft	3.310	2.840	3.010	3.360	2.950	2.320	2.230	1.830	1.910	907	1.610	1.840

Calendar Year 1964:	Max	66.2	Min	0.05	Mean mgd	29.2	Mean cfs	45.2	Ac-ft	32.830
Fiscal Year 1964-65:	Max	66.2	Min	0.02	Mean mgd	25.1	Mean cfs	38.8	Ac-ft	28.120

* Discharge measurement made on this day.
a No gage-height record.

7550. Kehena ditch near Kohala

Location.--Lat 20°07'25", long 155°45'05", on right bank at old Honokane weir, near head of West Branch Honokane Nui Stream, and 8.5 miles southeast of Kohala.

Records available.--December 1917 to November 1919, April 1928 to June 1965.

Gage.--Water-stage recorder and weir control. Altitude of gage is 3,850 ft (from topographic map). Prior to Apr. 26, 1928, at same site at different datum.

Average discharge.--38 years (1918-19, 1928-65), 7.46 mgd (11.5 cfs).

Extremes.--1917-19, 1928-65: Maximum daily discharge, 54 mgd (84 cfs) Mar. 23, 1919; no flow at times.

Remarks.--Records good except those for period of no gage-height record, which are poor. Ditch diverts from East Branch Honokane Nui Stream 2 miles above station for irrigation near Hawi. Small diversion upstream for watering stock.

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	8.04	4.20	4.45	2.28	5.92	0.56	1.32	6.24	*1.87	0.44	0	2.72
2	11.8	27.7	4.72	2.28	6.24	.84	.70	5.10	8.28	.44	1.42	10.7
3	8.85	10.7	2.50	6.24	18.3	1.32	.33	13.6	32.3	.33	3.45	5.92
4	11.1	5.38	1.68	3.95	10.4	.98	.14	3.95	18.3	6.41	2.95	2.72
5	12.2	3.20	3.68	*18.8	20.9	.56	.14	2.28	8.85	20.3	2.72	5.00
6	*8.20	2.06	2.72	8.52	30.3	.23	.14	2.06	7.87	27.3	1.68	9.97
7	3.68	1.32	6.57	9.60	24.9	.08	.14	1.32	5.38	19.6	5.71	a 9.0
8	2.06	9.09	6.24	6.24	33.3	.23	.08	.98	3.68	15.9	6.89	a 5.0
9	1.15	16.4	9.22	3.95	17.7	11.3	.08	.70	3.95	20.6	2.72	a 3.0
.0	.70	7.87	7.22	2.95	28.4	13.4	.33	.56	2.06	6.24	1.32	a 2.0
11	.84	5.92	7.87	2.50	22.7	20.2	.56	.44	1.68	2.72	.56	a 5.0
12	5.38	10.4	7.22	1.50	11.1	36.2	.14	.33	12.4	1.32	.14	a 1.1
13	5.00	7.55	9.60	.98	6.24	3.45	.14	.23	3.68	.84	.04	a 5.0
14	12.2	3.95	8.52	.56	2.95	1.68	.08	.23	2.06	.84	0	*a 3.0
15	23.3	1.87	4.20	3.78	1.68	.84	.23	3.06	4.72	.70	0	1.87
16	4.72	2.56	7.57	8.52	*1.32	.56	1.32	10.1	4.45	.56	0	1.50
17	2.28	*5.38	16.7	5.92	1.15	11.7	1.15	25.8	2.06	.33	0	1.32
18	1.68	6.24	20.0	1.87	.84	1.68	.44	7.22	1.32	.23	0	.98
19	15.9	2.95	6.24	26.6	5.38	12.5	.23	12.6	.98	*.23	0	2.06
20	14.7	1.50	4.20	16.8	3.68	4.72	.14	14.3	.70	.23	0	5.53
21	23.7	.84	5.38	22.4	9.01	1.68	3.72	11.1	1.90	.23	0	6.24
22	8.52	.70	3.95	15.1	2.28	1.32	42.2	9.22	12.4	.14	0	2.50
23	24.0	.56	2.06	22.6	2.28	.70	34.4	5.38	15.1	.08	0	1.68
24	12.1	.44	1.32	11.5	1.32	.33	17.5	3.95	15.4	.08	0	.98
25	3.68	.33	1.15	13.9	.84	.23	4.20	20.9	28.3	.02	0	.56
26	1.68	.23	.98	18.7	.56	.14	*6.89	6.57	5.59	0	0	.33
27	1.15	.14	2.36	12.2	.44	.14	4.20	7.22	2.06	0	0	.33
28	6.24	1.47	14.3	4.72	.33	.14	1.68	3.68	.98	0	0	3.20
29	13.1	1.50	16.2	2.28	.23	.14	13.1	---------	.70	0	.32	3.95
30	29.4	2.06	4.72	1.50	.14	.44	15.6	---------	.84	0	1.87	2.06
31	6.89	11.5	---------	2.06	---------	2.50	28.0	---------	.56	---------	.56	---------
Total	284.24	156.01	193.54	260.80	270.83	130.79	179.32	179.12	210.42	126.11	32.35	115.12
Mean												
Mgd	9.17	5.03	6.45	8.41	9.03	4.22	5.78	6.40	6.79	4.20	1.04	3.84
Cfs	14.2	7.78	9.98	13.0	14.0	6.53	8.94	9.90	10.5	6.50	1.61	5.94
Ac-ft	872	479	594	800	831	401	550	550	646	387	99	353

Calendar Year 1964:	Max	48.8	Min	0.08	Mean mgd	7.75	Mean cfs	12.0	Ac-ft	8700		
Fiscal Year 1964-65:	Max	42.2	Min	0	Mean mgd	5.86	Mean cfs	9.07	Ac-ft	6560		

* Discharge measurement made on this day.
a No gage-height record.

7560. Kohakohau Stream near Kamuela

Location.--Lat 20°03'02", long 155°40'58", on left bank 0.2 mile downstream from Kohala Forest Reserve boundary and 2 miles northwest of Kamuela.

Drainage area.--2.34 sq mi.

Records available.--March 1956 to June 1965.

Gage.--Water-stage recorder. Altitude of gage is 3,500 ft (from topographic map). Prior to Oct. 23, 1957, at datum 0.35 ft lower.

Average discharge.--9 years, 5.96 mgd (9.22 cfs).

Extremes.--Maximum discharge during year, 263 mgd (407 cfs) Dec. 12 (gage height, 4.31 ft), from rating curve extended above 21 mgd as explained below; minimum 0.18 mgd (0.28 cfs) Jan. 21.
1956-65: Maximum discharge, 2,510 mgd (3,880 cfs) Aug. 7, 1958 (gage height, 10.76 ft), from rating curve extended above 21 mgd by test on model of station site; minimum, 0.04 mgd (0.06 cfs) Nov. 22, 1962.

Remarks.--Records good except those above 50 mgd, which are poor. Parker Ranch pipeline diverts above station.

Rating tables (gage height, in feet, and discharge, in million gallons a day)

July 1 to Dec. 11				Dec. 12 to June 30			
0.5	0.15	0.9	4.50	0.4	0.07	0.9	4.50
.6	.60	1.1	10.0	.5	.30	1.1	10.0
.7	1.30	1.3	18.0	.6	.80	1.4	23.2
.8	2.50	1.7	43.5	.7	1.60	1.8	51.0
				.8	2.70		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	8.04	2.81	2.26	1.16	3.60	0.38	0.35	1.52	0.88	0.55	0.28	2.67
2	6.94	37.1	2.02	2.33	8.19	.33	.30	.96	9.21	.50	1.56	12.4
3	2.84	8.78	1.30	3.40	8.88	*.33	.30	.96	39.2	.45	2.68	2.70
4	3.20	3.20	1.30	2.85	4.02	.33	.30	.70	19.0	.40	2.37	1.44
5	9.97	2.14	2.02	21.7	14.4	.28	.30	.65	2.59	5.36	2.25	3.24
6	3.80	1.54	2.02	5.00	34.3	.28	*.28	.55	1.60	40.0	2.15	11.0
7	1.66	1.23	5.77	7.16	26.5	.28	.28	.50	1.20	10.0	2.26	4.50
8	1.02	8.73	6.65	2.67	33.6	.24	.28	.45	.96	14.2	2.15	3.42
9	.81	16.9	7.73	1.66	9.90	.42	.25	.35	.80	13.8	1.96	1.52
10	.67	4.25	2.14	1.54	25.9	2.14	.40	*.30	.70	2.48	1.44	1.04
11	1.09	6.37	2.02	1.42	28.5	3.73	.45	.28	.60	1.44	.88	1.99
12	2.67	11.9	1.78	.88	13.7	46.3	.30	.25	1.28	1.04	.70	5.12
13	2.67	5.50	3.20	.74	3.80	2.37	.28	.25	.80	.80	.60	1.60
14	16.2	2.67	3.80	.67	2.14	1.36	.28	.23	.70	.75	.50	1.28
15	27.1	1.78	2.26	2.10	1.54	1.04	.28	.92	1.12	.65	.45	.80
16	2.26	5.12	13.5	5.25	1.16	.80	.28	2.48	1.52	.60	.40	.70
17	1.42	3.20	20.4	2.50	1.02	7.66	.25	3.78	.75	.50	.30	.65
18	1.09	3.60	17.5	1.02	.81	1.44	.23	2.04	*.60	.45	.28	.55
19	13.4	1.78	2.38	4.90	1.30	6.33	.21	5.85	.50	.45	.28	.65
20	15.7	1.16	1.42	12.3	1.09	2.70	.21	10.8	.40	.40	.25	3.61
21	24.0	.95	2.02	32.7	1.02	1.20	.21	7.77	.40	.35	.25	2.53
22	4.02	.88	1.54	18.6	.74	.80	14.0	5.66	1.55	*.30	.23	1.28
23	20.5	.81	.95	27.8	.74	.70	31.5	2.37	2.37	.30	.23	.96
24	7.69	.67	.81	7.48	.60	.60	6.64	1.52	1.82	.30	.23	.70
25	2.14	.60	.67	14.4	.51	.55	1.52	2.48	6.82	.28	*.23	.60
26	1.42	.60	.60	17.1	.46	.50	1.28	1.44	1.44	.28	.28	.50
27	1.23	.56	3.42	10.6	.42	.45	.96	2.04	.88	.25	.30	.45
28	2.84	*6.95	15.6	2.14	.42	.45	.70	1.36	.70	.28	.28	.80
29	*10.4	2.26	14.2	*1.42	.38	.40	5.78	---------	.70	.28	.63	.75
30	30.0	2.02	*1.78	1.16	.38	.40	2.04	---------	.75	.25	.96	.60
31	3.80	17.6	---------	1.54	---------	.40	5.70	---------	.55	---------	.60	---------
Total	230.59	163.66	143.06	216.19	230.02	85.19	76.14	58.46	102.39	97.69	27.96	70.05
Mean												
Mgd	7.44	5.28	4.77	6.97	7.67	2.75	2.46	2.09	3.30	3.26	0.902	2.34
Cfs	11.5	8.17	7.38	10.8	11.9	4.25	3.81	3.23	5.11	5.04	1.40	3.62
Ac-ft	708	502	439	663	706	261	234	179	314	300	86	215

Calendar Year 1964:	Max	60.8	Min	0.23	Mean mgd	5.76	Mean cfs	8.91	Ac-ft	6470
Fiscal Year 1964-65:	Max	46.3	Min	0.21	Mean mgd	4.11	Mean cfs	6.36	Ac-ft	4610

Peak discharge (base, 200 mgd)

Date	Time	Gage height	Discharge	
			Mgd	Cfs
12-12	0630	4.31	263	407

* Discharge measurement made on this day.

7565. Kohakohau Stream at Waiaka, near Kamuela

Location.--Lat 20°01'48", long 155°42'05", on left bank 150 ft upstream from State Highway 25 at Waiaka and 2.0 miles west of Kamuela.

Drainage area.--4.30 sq mi.

Records available.--November 1963 to June 1965.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 2,410 ft (from topographic map).

Extremes.--Maximum discharge during year, 329 mgd (509 cfs) Dec. 12 (gage height, 4.83 ft), from rating curve extended above 110 mgd as explained below; no flow May 23-28.
1963-65: Maximum discharge, 1,430 mgd (2,210 cfs) Nov. 8, 1963 (gage height, 5.89 ft), from rating curve extended above 82 mgd by logarithmic plotting; no flow May 23-28, 1965.

Remarks.--Records good except those for periods of fragmentary gage-height record, which are fair, and those for periods of no gage-height record, which are poor. Two Parker Ranch pipeline diversions above station. Continuous records of rainfall are obtained at station.

Rating tables (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used Apr. 11-21)

July 1 to May 24

0	0	1.3	1.60
.2	.04	1.5	2.80
.3	.07	1.8	5.80
.5	.15	2.2	12.5
.7	.27	2.5	22.0
.9	.50	3.0	46.0
1.1	.90	3.5	85.0

May 25 to June 30

0.3	0	1.2	1.10
.5	.06	1.5	2.50
.6	.11	1.7	3.90
.7	.18	1.9	6.20
.9	.40	2.2	12.0
1.1	.80		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	6.33	2.10	2.66	1.02	2.80	0.31	0.16	1.50	0.55	0.25	0.03	1.04
2	9.66	45.6	1.80	.78	6.16	.28	.14	.62	3.87	.23	.05	11.0
3	3.12	11.6	1.08	4.60	11.6	.27	.13	.58	60.1	.18	2.72	2.92
4	3.52	3.90	.76	1.44	4.30	.26	.13	.41	25.7	.16	1.85	1.07
5	9.31	2.31	1.60	27.4	9.16	.24	.13	.36	3.90	3.16	1.60	1.74
6	5.32	1.40	1.36	6.50	49.5	.21	.12	.32	1.56	*55.5	1.56	10.1
7	1.70	.99	4.95	7.52	43.5	.20	.13	.26	.96	10.9	1.57	4.60
8	.88	6.23	5.40	3.20	50.0	.19	*.11	*.21	.67	14.0	2.53	3.58
9	.57	19.2	9.39	1.80	11.3	.24	.10	.20	.52	18.8	.90	1.34
10	.47	5.57	2.31	1.14	28.2	2.06	.12	.15	.44	3.28	1.32	.62
11	.45	5.52	f1.40	1.40	35.0	1.25	.30	.13	.37	1.14	.27	.29
12	2.01	11.9	a1.3	.78	16.2	68.8	.15	.12	1.08	.64	.14	4.60
13	3.32	6.22	a3.0	.58	5.44	3.46	.11	.10	.57	.44	.18	1.04
14	14.9	3.20	a3.8	.52	2.80	1.24	.10	.09	.42	.35	.15	.80
15	35.0	1.52	a2.0	.78	2.00	.78	.10	.16	.46	.27	.13	.48
16	3.12	a5.4	f12.2	4.96	1.24	.64	.11	3.39	1.20	.23	.10	.22
17	1.36	a3.5	25.2	3.70	1.02	7.72	.10	4.19	*.51	.20	.07	.15
18	.88	a3.8	24.3	1.05	.81	1.48	.07	1.60	.34	.18	*.05	.11
19	11.5	a2.0	3.12	3.47	1.17	4.22	.06	5.32	.26	.16	.04	.12
20	16.1	a .8	1.40	11.5	1.11	4.77	.05	10.9	.22	.15	.04	1.18
21	30.6	.60	1.70	42.0	1.04	1.08	.06	10.8	.20	.14	.04	2.76
22	5.94	.52	1.48	25.2	.72	.69	10.8	6.61	.62	.13	.01	.64
23	28.6	.45	.90	39.4	.72	.53	36.0	3.20	2.61	.11	0	.44
24	12.0	.40	.64	9.48	.53	.45	9.14	1.28	1.49	.09	0	.26
25	2.88	.33	.53	10.5	*.49	.40	1.48	2.28	7.82	.08	*0	.16
26	1.56	.28	.50	17.9	.45	.35	.88	1.14	1.59	.06	0	.10
27	.96	.26	1.05	f11.5	.40	.32	.74	1.56	.60	.05	0	.08
28	3.25	*6.37	15.0	*f2.80	.37	.29	.47	1.05	.37	.05	0	.08
29	f8.23	3.12	14.5	1.60	.33	.24	12.8	---------	.30	.05	.03	.35
30	f40.3	1.66	*2.10	1.11	.29	.17	2.70	---------	.45	.05	.55	.17
31	4.84	19.0	---------	1.08	---------	.17	5.32	---------	.28	---------	.25	---------
Total	268.68	175.75	147.43	246.71	288.65	103.31	82.81	58.53	120.03	111.03	16.18	52.04
Mean												
Mgd	8.67	5.67	4.91	7.96	9.62	3.33	2.67	2.09	3.87	3.70	0.522	1.73
Cfs	13.4	8.77	7.60	12.3	14.9	5.15	4.13	3.23	5.99	5.72	0.808	2.68
Ac-ft	825	539	452	757	886	317	254	180	368	341	50	160

Calendar Year 1964:	Max	153	Min	0.06	Mean mgd	8.00	Mean cfs	12.4	Ac-ft	8,980
Fiscal Year 1964-65:	Max	68.8	Min	0	Mean mgd	4.58	Mean cfs	7.09	Ac-ft	5,130

Peak discharge (base, 350 mgd).--No peak above base.

* Discharge measurement or observation of no flow made on this day.
a No gage-height record.
f Fragmentary gage-height record.

7570. Waikoloa Stream near Kamuela

Location.--Lat 20°03'17", long 155°40'02", on left bank 350 ft downstream from Parker Ranch boundary and 2.1 miles north of Kamuela.

Drainage area.--0.78 sq mi.

Records available.--May 1947 to June 1965. See also Note below.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 3,580 ft (from topographic map).

Average discharge.--18 years, 4.72 mgd (7.30 cfs).

Extremes.--Maximum discharge during year, 78.3 mgd (121 cfs) Mar. 2 (gage height, 2.97 ft); minimum, 0.70 mgd (1.08 cfs) May 19.
1947-65: Maximum discharge, 860 mgd (1,330 cfs) Oct. 23, 1957 (gage height, 6.55 ft), from rating curve extended above 62 mgd; minimum, 0.58 mgd (0.90 cfs) Nov. 13-22, 1962.

Remarks.--Records good. No diversion above station.

Note.--Published records for high-water periods in fiscal years 1949-60 have been found to be in error; revised records are on file in the district office and will be published in the next water-supply paper.

Rating table (gage height, in feet, and discharge, in million gallons a day)

1.2	0.58	1.8	7.80
1.3	1.24	1.9	10.3
1.4	2.13	2.1	17.8
1.6	4.58	2.4	33.4

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	5.57	4.36	3.64	2.24	4.32	1.56	1.16	2.04	1.56	1.24	1.09	4.19
2	5.03	20.9	3.51	4.03	8.90	1.56	1.16	1.48	12.5	1.24	2.96	11.2
3	3.13	7.12	2.57	4.88	7.08	*1.56	1.16	1.94	28.9	1.24	5.42	3.77
4	2.79	4.45	3.51	4.72	4.45	1.56	1.16	1.40	10.9	1.16	4.04	2.04
5	7.90	3.64	3.90	17.2	7.14	1.48	1.09	1.32	2.79	4.79	2.79	3.25
6	4.73	2.79	3.64	5.78	14.6	1.48	*1.02	1.16	2.04	17.9	2.90	8.73
7	2.68	2.57	5.48	5.94	13.2	1.48	1.02	1.09	1.75	4.88	3.25	4.04
8	2.24	8.36	7.31	3.77	20.5	1.48	1.02	1.02	1.56	9.08	2.35	3.90
9	2.04	12.4	5.78	2.79	6.27	1.75	1.02	*1.02	1.48	7.72	5.13	2.13
10	1.94	5.33	3.02	3.13	12.4	4.69	1.24	1.02	1.32	2.90	2.57	1.65
11	3.02	7.28	2.57	3.25	13.1	10.1	1.16	1.02	1.24	2.04	1.48	2.13
12	5.03	8.57	2.35	2.13	9.05	23.9	1.02	1.02	1.56	1.75	1.16	3.25
13	4.04	5.18	3.02	1.94	4.58	2.90	1.02	1.02	1.32	1.56	1.09	2.04
14	8.55	3.64	4.58	1.94	3.25	2.04	.95	1.02	1.24	1.48	1.02	1.65
15	14.0	2.90	3.38	2.79	2.68	1.75	.88	1.24	3.46	1.32	.95	1.40
16	3.25	8.13	11.2	5.78	2.46	1.65	.88	2.79	3.02	1.24	.88	1.32
17	2.68	4.58	16.6	3.51	2.13	6.13	.88	5.33	1.65	1.16	.88	1.24
18	2.68	4.18	10.1	2.04	2.04	2.24	.88	2.90	*1.37	1.16	.82	1.24
19	8.05	2.79	3.51	8.73	3.77	2.90	.82	5.94	1.24	1.16	.76	1.40
20	8.89	2.13	2.68	13.4	3.13	2.68	.82	8.05	1.24	1.09	.76	4.04
21	18.8	1.94	3.64	25.5	2.46	1.75	.88	5.93	1.32	*1.02	.76	2.46
22	5.48	1.85	3.25	17.5	2.04	1.56	13.8	5.65	2.76	1.02	.76	1.85
23	17.5	1.75	2.35	17.0	2.04	1.48	14.2	3.13	3.64	1.02	.76	1.75
24	5.48	1.65	1.94	6.78	1.85	1.40	4.24	2.57	4.28	1.02	.84	1.48
25	3.38	1.65	1.94	9.19	1.75	1.40	2.54	4.73	8.44	1.02	.88	1.24
26	3.02	1.56	1.85	10.4	1.65	1.32	3.13	2.57	2.46	1.02	*1.24	1.16
27	3.13	*1.56	5.90	6.95	1.65	1.32	2.24	3.77	1.75	.95	1.40	1.16
28	4.32	4.32	9.96	*3.66	1.56	1.24	1.48	2.13	1.48	.95	1.16	1.40
29	*6.68	3.02	*7.47	2.79	1.56	1.24	3.88	---------	1.48	.95	1.98	1.48
30	12.7	3.13	2.68	2.35	1.56	1.24	2.79	---------	1.40	.95	2.46	1.24
31	4.45	12.7	---------	2.57	---------	1.24	4.88	---------	1.32	---------	1.40	---------
Total	183.18	156.43	143.33	204.68	163.17	90.08	74.42	74.30	112.47	76.03	55.94	79.83
Mean												
Mgd	5.91	5.05	4.78	6.60	5.44	2.91	2.40	2.65	3.63	2.53	1.80	2.66
Cfs	9.14	7.81	7.40	10.2	8.42	4.50	3.71	4.10	5.62	3.91	2.79	4.12
Ac-ft	562	480	440	628	501	276	228	228	345	233	172	245

Calendar Year 1964:	Max	36.3	Min	1.02	Mean mgd	4.81	Mean cfs	7.44	Ac-ft	5400
Fiscal Year 1964-65:	Max	28.9	Min	0.76	Mean mgd	3.87	Mean cfs	5.99	Ac-ft	4340

Peak discharge (base, 100 mgd).--No peak above base.

* Discharge measurement made on this day.

7580. Waikoloa Stream at Marine Dam, near Kamuela

Location.--Lat 20°02'48", long 155°39'58", on right bank 160 ft upstream from Marine Dam and 1.5 miles north of Kamuela.

Drainage area.--1.18 sq mi.

Records available.--May 1947 to June 1965.

Gage.--Water-stage recorder (digital) and concrete control. Altitude of gage is 3,450 ft (from topographic map).

Average discharge.--18 years, 5.80 mgd (8.97 cfs).

Extremes.--Maximum discharge during year, 92.8 mgd (144 cfs) Mar. 2 (gage height, 3.18 ft); minimum, not determined; minimum daily, 0.7 mgd (1.1 cfs) May 18-23.

1947-65: Maximum discharge, 1,180 mgd (1,830 cfs) Oct. 23, 1957 (gage height, 6.99 ft), from rating curve extended above 76 mgd; minimum, 0.52 mgd (0.80 cfs) Nov. 21, 1962.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Diversion above station for livestock and domestic use.

Rating table (gage height, in feet, and discharge, in million gallons a day)

1.4	0.60	2.2	14.0
1.5	1.15	2.4	23.0
1.7	3.05	2.7	43.0
1.9	6.40		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	6.00	4.34	3.57	2.30	4.34	1.4	1.1	2.30	1.58	1.15	0.96	4.86
2	6.00	27.4	3.18	4.18	9.56	1.4	1.1	1.58	14.8	1.10	2.83	13.4
3	3.05	9.56	2.30	6.00	9.80	*1.4	1.1	2.30	36.6	1.03	7.28	4.18
4	2.72	4.68	3.31	5.22	5.04	1.4	1.1	1.43	15.2	1.10	5.60	2.10
5	9.56	3.70	3.57	22.0	7.72	1.3	1.0	1.29	3.70	4.86	2.94	3.70
6	5.60	2.61	3.44	7.50	19.5	1.3	*1.03	1.15	2.40	21.5	3.0	11.0
7	2.61	2.40	5.60	7.50	17.6	1.3	.96	1.10	1.82	6.00	3.5	4.50
8	2.10	9.56	7.94	3.86	26.8	1.3	.96	1.03	1.66	11.0	2.5	4.50
9	1.74	16.0	6.62	2.83	8.84	1.5	.96	*1.03	1.50	10.8	6.0	2.20
10	1.66	6.62	2.94	3.44	15	5.0	1.29	.96	1.43	3.05	3.0	1.58
11	3.05	8.84	2.50	3.31	16	11	1.22	.90	1.36	2.10	1.5	2.30
12	5.04	11.0	2.20	2.20	10	30	1.03	.85	2.00	1.66	1.1	3.57
13	4.50	5.80	2.94	2.00	5.0	4.0	.96	.85	1.50	1.43	1.0	2.10
14	10.5	3.70	4.86	2.00	3.5	2.0	.90	.85	1.36	1.36	.9	1.58
15	18.0	2.61	3.44	3.18	2.7	1.7	.96	1.10	4.18	1.22	.9	1.36
16	3.31	8.60	12.5	7.72	2.2	1.6	.96	2.83	4.02	1.15	.8	1.36
17	2.50	5.60	19.5	4.18	2.1	7.0	.90	6.40	1.74	1.10	.8	1.29
18	2.40	4.50	113	2.30	2.0	2.3	.85	3.05	*1.36	1.10	.7	1.15
19	10.3	2.72	3.86	11.6	4.0	3.0	.85	7.28	1.15	1.03	.7	1.36
20	11.3	2.20	2.61	19.5	3.3	2.7	.80	11.3	1.10	1.03	.7	4.68
21	23.6	1.82	3.86	34.4	2.5	1.8	.85	8.16	1.15	*.96	.7	3.44
22	6.84	1.82	3.44	22.0	2.0	1.5	16.8	7.50	2.83	.96	.7	2.00
23	22.5	1.66	2.30	21.0	2.0	1.4	19.5	3.70	3.86	.96	.7	1.74
24	7.72	1.58	2.00	8.84	1.8	1.3	5.60	2.83	4.68	.96	*.85	1.50
25	3.31	1.43	1.82	11.3	1.7	1.3	4.02	6.00	10.8	.90	.85	1.29
26	2.94	1.43	1.82	12.8	1.6	1.3	4.50	2.83	2.61	.90	*1.10	1.15
27	2.83	*1.43	6.20	9.56	1.6	1.3	2.61	4.34	1.58	.90	1.29	1.15
28	4.68	4.34	11.9	*3.86	1.5	1.2	1.58	2.20	1.36	.90	1.10	1.36
29	*7.28	2.94	*9.56	2.83	1.5	1.2	4.68	---------	1.29	.90	2.10	1.50
30	16.8	3.05	2.94	2.40	1.5	1.2	3.18	---------	1.29	.85	2.40	1.22
31	5.04	14.0	---------	2.50	---------	1.2	6.20	---------	1.15	---------	1.29	---------
Total	215.48	177.94	154.02	254.31	192.70	97.3	89.55	87.14	133.06	83.96	59.79	89.12
Mean												
Mgd	6.95	5.74	5.13	8.20	6.42	3.14	2.89	3.11	4.29	2.80	1.93	2.97
Cfs	10.8	8.88	7.94	12.7	9.93	4.86	4.47	4.81	6.64	4.33	2.99	4.60
Ac-ft	661	546	473	780	591	299	275	267	408	255	183	273

Calendar Year 1964:	Max	45	Min	0.95	Mean mgd	5.63	Mean cfs	8.71	Ac-ft	6,330		
Fiscal Year 1964-65:	Max	36.6	Min	0.7	Mean mgd	4.48	Mean cfs	6.93	Ac-ft	5,010		

Peak discharge (base, 100 mgd).--No peak above base.

* Discharge measurement made on this day.

Note.--No gage-height record Nov. 10 to Jan. 5, May 6-23.

7590. Hauani Gulch near Kamuela
(Formerly published as Hauani Stream near Kamuela)

Location.--Lat 20°02'28", long 155°39'05", on left bank 1,350 ft downstream from Hawaii County pipeline intake and 1.8 miles northeast of Kamuela.

Drainage area.--0.47 sq mi.

Records available.--March 1956 to June 1965. Prior to July 1964, published as Hauani Stream near Kamuela.

Gage.--Water-stage recorder (digital) and concrete control. Datum of gage is 3,117.42 ft above mean sea level (Hawaii County Board of Water Supply bench mark).

Average discharge.--9 years, 1.02 mgd (1.58 cfs).

Extremes.--Maximum discharge during year, 55.2 mgd (85.4 cfs) Nov. 8 (gage height, 2.58 ft), from rating curve extended above 22 mgd by logarithmic plotting; no flow May 24, 28.
1956-65: Maximum discharge, 325 mgd (503 cfs) Oct. 23, 1957 (gage height, 4.65 ft), from rating curve extended above 7.0 mgd by slope-conveyance study; no flow at times.

Remarks.--Records fair. Diversion above station for livestock and domestic use.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.74	0	1.3	1.77
.8	.01	1.4	2.70
.9	.08	1.6	5.50
1.0	.27	1.8	9.50
1.1	.63	1.9	12.5
1.2	1.10		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.99	0.71	0.30	0.25	0.39	0.15	0.07	0.21	0.21	0.09	0.01	0.79
2	.79	6.50	.27	.84	2.11	.13	.07	.43	4.90	.08	.13	1.77
3	.30	1.55	.23	.67	1.10	*.13	.07	.21	*10.7	.08	1.10	.33
4	.25	.67	.33	1.10	.59	.11	.07	.15	2.70	.09	.71	.13
5	1.16	.47	.30	5.35	1.55	.09	.06	.15	.63	.59	.27	.43
6	.67	.36	.47	1.10	4.30	.09	*.06	.11	.51	5.50	.71	1.62
7	.27	.33	.75	.94	3.61	.09	.04	.09	.43	*.75	.30	.55
8	.21	1.69	1.62	.51	7.70	.09	.04	*.09	.30	3.22	.17	.51
9	.17	2.50	.75	.36	1.10	.17	.03	.08	.25	2.40	.07	.17
10	.15	.89	.33	.39	3.87	.43	.09	.07	.23	.39	.07	.09
11	.30	1.48	.27	.33	3.35	2.96	.08	.07	.21	.23	.03	.30
12	.59	1.41	.23	.23	1.93	8.90	.05	.06	.36	.19	.02	.43
13	.39	.75	.27	.21	.75	.39	.05	.05	.21	.13	.02	.13
14	1.77	.51	.55	.21	.51	.27	.04	.05	.19	.11	.02	.07
15	4.30	.39	.36	.36	.39	.27	.04	.11	.43	.08	.02	.05
16	.43	2.60	2.40	.99	.30	.23	.05	.13	.39	.07	.01	.05
17	.30	.75	5.90	.47	.27	1.85	.04	1.10	*.19	.06	.01	.06
18	.39	.75	2.02	.21	.25	.25	.03	.27	.11	.04	*.01	.02
19	1.77	.39	.47	3.35	.43	.71	.03	1.16	.08	.04	.01	.03
20	2.30	.30	.33	4.15	.36	.36	.03	2.11	.08	.04	.01	.43
21	5.90	.25	.47	9.30	.25	.17	.03	1.62	.08	.03	.01	.25
22	1.04	.25	.39	4.45	.21	.15	2.70	.94	.55	*.02	.01	.08
23	4.15	.23	.23	5.20	.21	.13	4.30	.55	.99	.02	.01	.05
24	1.10	.21	.21	1.28	.19	.11	.84	.43	.94	.02	0	.02
25	.59	.21	.21	1.34	.17	.11	2.20	1.10	1.55	.01	.01	.01
26	.51	.19	.21	1.62	.17	.09	1.16	.36	.27	.01	.01	.01
27	.63	.17	1.04	1.16	.17	.09	.47	.39	.17	.01	.01	.01
28	.75	*.19	1.62	.55	.15	.09	*.21	.25	.15	.04	0	.04
29	1.34	.17	1.10	*.39	.15	.08	.36	---------	.11	.03	.27	.03
30	*3.22	.21	*.33	.30	.15	.08	.55	---------	.09	.01	.15	.01
31	.67	1.69	---------	.30	---------	.08	1.04	---------	.08	---------	.02	---------
Total	37.40	28.77	23.96	47.91	36.68	18.85	14.90	12.34	28.09	14.38	4.20	8.47
Mean												
Mgd	1.21	0.928	0.799	1.55	1.22	0.608	0.481	0.441	0.906	0.479	0.135	0.282
Cfs	1.87	1.44	1.24	2.40	1.89	0.941	0.744	0.682	1.40	0.741	0.209	0.436
Ac-ft	115	88	74	147	113	58	46	38	86	44	13	26

Calendar Year 1964:	Max	15.3	Min	0.01	Mean mgd	0.994	Mean cfs	1.54	Ac-ft	1,120	
Fiscal Year 1964-65:	Max	10.7	Min	0	Mean mgd	0.756	Mean cfs	1.17	Ac-ft	848	

* Discharge measurement made on this day.

Peak discharge (base, 50 mgd)

Date	Time	Gage height	Discharge	
			Mgd	Cfs
11-8	0215	2.58	55.2	85.4

7592. Right Branch Waiaha Stream near Holualoa

Location.--Lat 19°38'41", long 155°54'55", on right bank 1,000 ft upstream from reservoir, 1.0 mile northeast of Holualoa Makai Camp, and 2.9 miles northeast of Holualoa School.

Drainage area.--1.89 sq mi.

Records available.--April 1960 to June 1965.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 3,280 ft (from topographic map).

Average discharge.--5 years, 0.242 mgd (0.374 cfs).

Extremes.--Maximum discharge during year, 113 mgd (175 cfs) June 3 (gage height, 4.04 ft), from rating curve extended above 0.87 mgd as explained below; no flow for many days.
1960-65: Maximum discharge, 196 mgd (303 cfs) May 27, 1964 (gage height, 4.70 ft), from rating curve extended above 0.87 mgd on basis of slope-area measurement at gage height 4.07 ft; no flow at times each year.

Remarks.--Records good. No diversion above station. Continuous records of rainfall are obtained at station.

Rating table (gage height, in feet, and discharge, in million gallons a day)

1.06	0	1.6	1.14
1.1	.01	1.7	1.70
1.2	.07	1.9	3.40
1.3	.20	2.2	7.70
1.4	.40	2.5	14.5
1.5	.70		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.12	0.02	0.02	0.13	0.01	0.01	0.01	0	0	0.25	0.04	0.49
2	*.16	**.03	.02	.08	.35	.01	.01	0	0	.10	.02	3.01
3	.16	.03	.01	.06	.30	.01	.01	0	0	.16	.01	13.0
4	.13	.02	.01	.05	.11	.01	.01	0	0	.11	.01	.69
5	.07	.01	.01	.04	.03	.01	.01	0	0	.05	.03	.45
6	.05	.02	.03	.05	.02	.01	.01	0	0	.04	.03	.25
7	.04	.02	.04	.11	.07	.01	.01	0	0	.47	.05	.13
8	.03	.03	.03	.13	.05	.01	.02	0	0	.35	.03	.08
9	.03	.06	.02	.10	.03	.22	.01	*0	0	.88	.02	.06
10	.04	.07	*.04	.09	.02	5.64	.19	0	.01	.76	1.47	.05
11	.07	.07	.06	.05	.01	.43	.08	0	1.49	.29	.27	.03
12	.03	.04	.10	.03	*.01	5.98	.02	0	.38	.11	.15	.03
13	.04	.04	.08	*.03	.01	.33	*.01	0	.20	.06	.10	.04
14	.09	.07	.11	.02	.01	*.11	.01	0	.06	.09	.05	.04
15	.21	.12	.11	.02	.01	.05	.01	.26	*.03	*.04	.06	.06
16	.25	.07	.10	.01	.01	.55	.01	.08	.02	.02	.15	.05
17	.18	.05	.08	.01	.01	3.27	.01	.02	.02	.02	.51	.06
18	.10	.03	.06	.02	.01	.13	0	.01	.01	.01	.35	.06
19	.05	.05	.03	.02	.01	1.40	0	.01	.01	.01	.31	.05
20	.04	.16	.03	.01	.01	.63	0	.01	.01	.01	.23	.05
21	.08	.23	.03	.01	.02	.18	0	0	.35	.01	.12	3.22
22	.11	.16	.05	.01	.01	.09	0	0	.79	.01	.07	.52
23	.06	.10	.08	.01	.01	.05	0	0	2.05	.01	.10	.16
24	.05	.13	.10	.01	.01	.03	.01	0	.18	.01	*.10	.34
25	.04	.25	.05	.01	.01	.02	0	0	.10	.01	.05	.48
26	.03	.08	.03	.01	.01	.01	0	0	.09	.01	.36	.13
27	.02	.04	.12	.01	.01	.01	0	0	.05	.01	.27	.13
28	.02	.04	.92	.01	.01	.01	0	0	.03	.01	.33	.12
29	.01	.04	2.89	.01	.01	.01	0	---------	.02	.01	.20	.11
30	.01	.04	.41	.01	.01	.01	0	---------	.02	.04	1.47	.12
31	.01	.03	---------	.01	---------	.01	0	---------	*.02	---------	1.10	---------
Total	2.33	2.15	5.67	1.17	1.20	19.25	0.45	0.39	5.94	3.96	8.06	24.01
Mean												
Mgd	0.075	0.069	0.189	0.038	0.040	0.621	0.015	0.014	0.192	0.132	0.260	0.800
Cfs	0.116	0.107	0.292	0.059	0.062	0.961	0.023	0.022	0.297	0.204	0.402	1.24
Ac-ft	7.2	6.6	17	3.6	3.7	59	1.4	1.2	18	12	25	74

Calendar Year 1964:	Max	27.5	Min	0	Mean mgd	0.262	Mean cfs	0.405	Ac-ft	293
Fiscal Year 1964-65:	Max	13.0	Min	0	Mean mgd	0.204	Mean cfs	0.316	Ac-ft	229

* Discharge measurement made on this day.
** Field estimate made on this day.

Peak discharge (base, 25 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
9-29	1800	2.91	29.0	44.9	6- 3	1330	4.04	113	175
12-12	1630	3.86	94.0	145	6-21	2030	2.92	29.4	45.5
12-17	0015	3.08	37.8	58.5					

7593. Waiaha Stream at Luawai, near Holualoa

Location.--Lat 19°38'12", long 155°55'45", on right bank at Luawai, 1.8 miles northeast of Holualoa Post Office, and 4.2 miles southeast of Honokohau School.

Drainage area.--8.74 sq mi.

Records available.--April 1960 to June 1965.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 2,580 ft (from topographic map).

Average discharge.--5 years, 0.495 mgd (0.766 cfs).

Extremes.--Maximum discharge during year, 305 mgd (472 cfs) June 3 (gage height, 4.58 ft), from rating curve extended above 20 mgd as explained below; no flow for many days.
1960-65: Maximum discharge, 313 mgd (484 cfs) Mar. 29, 1961 (gage height, 4.61 ft), from rating curve extended above 20 mgd on basis of slope-area measurements at gage heights 4.34 and 4.51 ft; no flow at times each year.

Remarks.--Records good except those for period of no gage-height record, which are fair. Huehue Ranch diverts entire low flow of a tributary above station for domestic use.

Rating table (gage height, in feet, and discharge, in million gallons a day)

1.04	0	1.6	1.50
1.1	.02	1.7	2.30
1.2	.10	1.9	4.50
1.3	.25	2.2	10.0
1.4	.50	2.6	23.0
1.5	.90	2.9	40.0

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.14	0.01	0.02	0.16	0.01	0	0	0	0	0.17	0.18	0.45
2	*.18	.01	.02	.08	.89	0	0	0	0	.05	.02	10.6
3	.14	.01	.01	.05	.71	0	0	0	0	.34	.01	34.7
4	.10	.01	.01	.03	.22	0	0	0	0	.14	.02	1.38
5	.06	**.05	.01	.02	.04	0	0	0	0	.03	.03	.48
6	.03	.02	.01	.04	.01	0	0	0	0	.02	.01	.28
7	.02	.01	.01	.59	.01	0	0	0	0	1.06	.01	.16
8	.01	.01	.01	.42	.01	0	.02	0	0	.58	.01	.09
9	.01	.01	.10	.79	0	0	.01	*0	0	1.79	.01	.06
10	.01	.03	*.05	.25	0	11.4	.19	0	.02	1.13	1.71	.05
11	.03	.03	.26	.09	0	a1.0	.06	0	3.89	.30	.42	.03
12	.04	.02	.19	.04	*0	a12	.01	0	.40	.09	.28	.02
13	.02	.05	.09	*.02	0	a.8	*.01	0	.16	.03	.09	.03
14	.08	.06	.19	.01	0	*a.2	0	0	.02	.05	.06	.06
15	.06	.06	.20	.01	0	.06	0	.16	*0	*.01	.09	.12
16	.19	.04	.18	.01	0	.30	0	.02	0	.01	.40	.06
17	.19	.01	.13	.01	0	7.56	0	0	0	0	1.08	.04
18	.10	.02	.07	.05	0	.16	0	0	0	0	.45	.05
19	.04	.06	.02	.01	0	.23	0	0	0	0	.30	.03
20	.03	.50	.02	.01	0	1.00	0	0	0	0	.30	.11
21	.10	.42	.01	.01	.01	.24	0	0	.41	.01	.12	10.7
22	.18	.19	.03	0	0	.10	0	0	.94	0	.03	*1.18
23	.06	.09	.09	0	0	.06	0	0	2.85	0	.33	.24
24	.03	.36	.54	0	0	.03	0	0	.14	.01	*.22	1.33
25	.02	.74	.13	0	0	.02	0	0	.06	.01	.05	.90
26	.03	.13	.06	0	0	.01	0	0	.06	.01	.74	.20
27	.05	.05	.07	.01	0	.01	0	0	.03	0	.61	.14
28	.02	.03	1.13	.01	0	.01	0	0	.01	0	.71	.19
29	.01	.04	6.52	.01	0	.01	0	---------	.01	0	.30	.16
30	.01	.04	.50	.01	0	0	0	---------	.01	1.73	2.05	.09
31	.01	.02	---------	0	---------	0	0	---------	.01	---------	.66	---------
Total	2.00	3.13	10.68	2.74	1.91	35.20	0.30	0.18	9.02	7.57	11.30	63.93
Mean												
Mgd	0.065	0.101	0.356	0.088	0.064	1.14	0.010	0.006	0.291	0.252	0.365	2.13
Cfs	0.100	0.156	0.551	0.136	0.099	1.76	0.016	0.009	0.450	0.390	0.565	3.30
Ac-ft	6.1	9.6	33	8.4	5.9	108	0.9	0.6	28	23	35	196

Calendar Year 1964: Max 44.9 Min 0 Mean mgd 0.404 Mean cfs 0.625 Ac-ft 454
Fiscal Year 1964-65: Max 34.7 Min 0 Mean mgd 0.405 Mean cfs 0.627 Ac-ft 454

Peak discharge (base, 90 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
12-12	about 1700	3.92	154	238	6- 3	1330	4.58	305	472
					6-21	2000	3.83	140	217

* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
a No gage-height record.

7595. Waiaha Stream near Holualoa

Location.--Lat 19°38'12", long 155°56'40", on left bank 0.5 mile east of Waiaha, 1.2 miles north of Holualoa School, and 3.2 miles east of Kailua.

Drainage area.--9.35 sq mi.

Records available.--December 1957 to June 1965. See also Note below.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 1,910 ft (from topographic map).

Average discharge.--7 years (1958-65), 0.661 mgd (1.02 cfs).

Extremes.--Maximum discharge during year, 645 mgd (998 cfs) June 21 (gage height, 3.65 ft), from rating curve extended above 160 mgd as explained below; no flow for many days.

1957-65: Maximum discharge, 1,560 mgd (2,410 cfs) Jan. 18, 1959 (gage height, 4.76 ft), from rating curve extended above 160 mgd on basis of 2 slope-area measurements at gage height 3.80 ft; no flow for many days each year.

Remarks.--Records good. Diversion to offstream reservoir one mile above station for stock water.

Note.--Published records for high-water periods in the fiscal years 1959 and 1960 have been found to be in error; revised records are on file in the district office and will be published in the next water-supply paper.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.23	0	0.8	3.40
.3	.03	.9	5.20
.4	.18	1.0	7.60
.5	.55	1.2	14.5
.6	1.14	1.5	32.0
.7	2.05		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.01	0	0	0.02	0	0.01	0		0	0	0.05	0.03
2	*.01	0	0	.01	.03	.01	0		0	.01	0	21.9
3	.01	0	0	.01	.25	.01	0		0	.02	0	29.5
4	0	*0	0	.01	.03	.01	0		0	.02	0	.54
5	0	0	0	0	.01	0	0		0	.01	0	.03
6	0	0	0	0	.01	0	0		0	.01	0	.01
7	0	0	0	.17	0	0	0		0	2.06	0	.01
8	0	0	0	.07	0	0	0		0	.12	0	0
9	0	0	0	.74	0	0	0	(*)	0	1.27	0	0
10	0	0	*.01	.10	0	12.2	0		0	.16	3.17	0
11	0	0	.01	.02	0	1.60	.01		2.55	.03	.18	0
12	0	0	.02	*.01	0	21.2	0		.03	.01	.03	0
13	0	.02	.01	.01	*0	.81	*0		.01	.01	.01	0
14	.03	.02	.01	.01	0	.03	0		0	.01	.01	0
15	.01	.01	.01	0	0	*.01	0		*0	*0	.05	0
16	.03	.01	.01	0	0	.01	0		0	0	.15	0
17	.18	.01	.03	0	0	10.6	0		0	0	.55	.01
18	.05	0	.02	0	0	.02	0		0	0	.20	.01
19	.02	.01	.01	0	0	2.26	0		0	0	.06	0
20	.01	.29	.01	0	0	.33	0		0	0	.06	.02
21	.02	.13	.01	0	0	.03	0		0	0	.03	24.9
22	.04	.04	.01	0	0	.02	0		0	0	.01	1.67
23	.02	.03	.01	0	0	.01	0		3.32	0	.19	.02
24	.02	.23	2.59	0	0	.01	0		.02	0	*.05	5.08
25	.01	.43	.05	0	0	.01	0		.01	0	.01	1.19
26	.01	.02	.04	0	0	.01	0		.01	0	.24	.02
27	.01	.01	.03	0	0	0	0		0	0	.09	.01
28	.01	.01	.02	0	0	0	0		0	0	.08	.06
29	0	.01	13.1	0	0	0	0	---------	0	0	.02	.03
30	0	.01	.45	0	.01	0	0	---------	0	2.36	2.89	.01
31	0	.01	---------	0	---------	0	0	---------	0	---------	.10	---------
Total	0.50	1.30	16.46	1.18	0.34	49.20	0.01	0	5.95	6.10	8.23	85.05
Mean												
Mgd	0.016	0.042	0.549	0.038	0.011	1.59	0.0003	0	0.192	0.203	0.265	2.84
Cfs	0.025	0.065	0.849	0.059	0.017	2.46	0.0005	0	0.297	0.314	0.410	4.39
Ac-ft	1.5	4.0	51	3.6	1.0	151	0.03	0	18	19	25	261

Calendar Year 1964: Max 37.1 Min 0 Mean mgd 0.410 Mean cfs 0.634 Ac-ft 461
Fiscal Year 1964-65: Max 29.5 Min 0 Mean mgd 0.478 Mean cfs 0.740 Ac-ft 535

* Discharge measurement or observation of no flow made on this day.

Peak discharge (base, 100 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
9-29	1800	2.29	123	190	6-3	1400	2.98	317	490
12-12	1730	2.49	163	252	6-21	2000	3.65	645	998

7598. Kiilae Stream near Honaunau

Location.--Lat 19°24'52", long 155°50'56", on right bank 2.4 miles northeast of Kealia and 2.9 miles southeast of Honaunau Post Office.

Drainage area.--0.67 sq mi.

Records available.--April 1958 to June 1965.

Gage.--Water-stage recorder. Datum of gage is 2,898 ft above mean sea level (by stadia traverse).

Average discharge.--7 years, 0.156 mgd (0.241 cfs).

Extremes.--Maximum discharge during year, 27.0 mgd (41.8 cfs) Dec. 12 (gage height, 1.75 ft); no flow for many days.
1958-65: Maximum discharge, 67 mgd (104 cfs) Jan. 13, 1959 (gage height, 2.32 ft), from rating curve extended above 3.7 mgd by logarithmic plotting; no flow at times each year.

Remarks.--Records good except those for periods of no gage-height record, which are poor. No diversion above station. Continuous records of rainfall are obtained at station.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.5	0	1.0	0.87
.6	.03	1.1	1.70
.7	.08	1.2	3.00
.8	.18	1.3	5.00
.9	.40		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	*0.03	0	0.08	0.02	0.1	0.10	0	0	0	0.91	0.07	0.25
2	.07	0	.06	.04	.2	.05	0	0	0	.07	.21	1.71
3	.04	0	.03	.02	.1	.02	0	0	.30	.67	.73	1.64
4	.02	*.01	.06	.01	.3	.04	0	.02	.02	.08	.40	.96
5	.02	0	.04	.01	.1	.04	0	0	.03	.02	.21	.18
6	0	0	.15	.05	.05	.02	0	0	.01	.03	.34	.07
7	0	.01	.34	.25	.02	.01	0	0	0	.58	.07	.04
8	0	0	.07	.08	.1	.01	0	*.25	0	.93	.48	.03
9	0	0	*.19	.04	.05	.01	0	.01	0	1.13	.45	.05
10	0	.03	.26	.06	.02	2.37	1.05	0	1.25	.40	.98	.02
11	0	.08	.13	.02	.01	.21	.08	0	.11	.09	.13	.02
12	.03	.13	.11	*.01	.01	3.10	.01	0	.08	.05	.41	.21
13	.07	.11	.04	.01	*0	.15	0	0	.06	.02	.09	.59
14	.20	.72	.01	0	0	.04	*0	0	.02	.02	.04	.19
15	.50	.03	0	0	.06	*1.24	0	.08	.02	0	.12	.49
16	.43	.03	.10	.02	.12	.64	0	.01	*.05	*0	.34	.30
17	.69	.01	.02	0	.04	1.69	0	0	.04	0	.47	.19
18	.05	.09	0	.3	0	.04	0	0	.02	0	.18	.09
19	.01	.22	0	.1	.02	.58	0	0	.01	0	.09	.05
20	.11	.13	.13	.1	.02	.81	0	.01	0	0	.14	.05
21	.28	.12	.08	.1	.01	.08	0	0	.29	.14	.06	.06
22	.33	.12	.04	.2	.53	.07	0	0	.92	.06	.02	.07
23	.15	.07	.02	.1	.20	.02	0	0	1.98	.04	.12	.08
24	.08	.42	.01	.1	.02	.02	0	0	.26	.47	.07	.06
25	.03	.22	.01	.2	.02	.02	0	0	1.40	.06	*.01	.13
26	.01	.01	.09	.7	.04	0	0	0	.31	.02	.31	.20
27	.02	.23	.21	.5	1.63	0	0	0	.08	.06	.23	.09
28	0	.98	.20	.3	.09	0	0	0	.02	.10	.49	.63
29	0	.22	.48	.1	.08	0	0	---------	.01	.07	.10	.42
30	0	.12	.05	.05	.08	0	0	---------	*.16	.93	.98	.07
31	0	.08	---------	.01	---------	0	0	---------	.06	---------	.29	---------
Total	3.17	4.19	3.01	3.50	4.02	11.38	1.14	0.38	7.51	6.95	8.63	8.94
Mean												
Mgd	0.102	0.135	0.100	0.113	0.134	0.367	0.037	0.014	0.242	0.232	0.278	0.298
Cfs	0.158	0.209	0.155	0.175	0.207	0.568	0.057	0.022	0.374	0.359	0.430	0.461
Ac-ft	9.7	13	9.2	11	12	35	3.5	1.2	23	21	26	27

Calendar Year 1964:	Max	5.0	Min	0	Mean mgd	0.200	Mean cfs	0.309	Ac-ft	224
Fiscal Year 1964-65:	Max	3.10	Min	0	Mean mgd	0.172	Mean cfs	0.266	Ac-ft	192

Peak discharge (base, 20 mgd)

Date	Time	Gage height	Discharge	
			Mgd	Cfs
12-12	1830	1.75	27.0	41.8

* Discharge measurement or observation of no flow made on this day.

Note.--No gage-height record July 1, Oct. 12 to Nov. 12.

7705. Paauau Gulch at Pahala

Location.--Lat 19°12'40", long 155°28'45", on right bank 100 ft downstream from bridge on Wood Valley Road and 0.7 mile north of Pahala.
Drainage area.--1.42 sq mi.
Records available.--May 1962 to June 1965.
Gage.--Water-stage recorder. Altitude of gage is 970 ft (from topographic map).
Extremes.--Maximum discharge during year, 188 mgd (291 cfs) Nov. 14 (gage height, 3.77 ft); no flow most of the time.
1962-65: Maximum discharge, 813 mgd (1,260 cfs) Oct. 18, 1962 (gage height, 4.87 ft, from floodmark), from rating curve extended above 230 mgd on basis of slope-area measurement at gage height 4.40 ft; no flow most of the time each year.
Revisions.--The maximum discharge for the fiscal year 1964 has been revised to 119 mgd (184 cfs) Mar. 22, 1964 (gage height, 3.42 ft), superseding figure published in Surface Water Records of Hawaii and other Pacific Areas (1964).
Remarks.--Records good. No diversion above station.
Revisions.--Revised figures of discharge, in million gallons a day, for high-water periods in the fiscal year 1964, superseding those published in Surface Water Records of Hawaii and other Pacific Areas (1964) are given herewith:

1963		1964-Con.	
July 22	3.40	Mar. 20	0.55
		22	13.9
1964		24	.37
Jan. 4	.16	May 24	2.20

Month	Million gallons	Maximum	Minimum	Mean Mgd	Mean Cfs	Runoff in acre-feet
July 1963	3.43	3.40	0	0.111	0.172	11
Calendar year 1963	-	66.4	0	.489	.757	549
January 1964	.70	.32	0	.023	.036	2.1
March	15.64	13.9	0	.505	.781	48
May	2.88	2.20	0	.093	.144	8.8
Fiscal year 1963-64	-	13.9	0	.063	.098	71

Revised peak discharge.--1963-64: Mar. 22 (1500) 119 mgd (184 cfs), 3.42 ft.

Rating table (gage height, in feet, and discharge, in million gallons a day)

1.1	0	1.5	0.60	1.9	4.70
1.2	.03	1.6	1.20	2.0	6.80
1.3	.10	1.7	2.00	2.3	16.0
1.4	.30	1.8	3.10	2.6	31.0

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0				0	0	0	0	0	0.01	0	0
2	0				*0	0	0	0	0	0	0	*0
3	0				0	0	0	0	0	0	1.04	.03
4	.05				0	0	0	0	0	0	*26.1	0
5	0				0	0	0	0	0	0	.36	0
6	0				0	0	0	0	0	2.59	.67	.05
7	0				0	0	0	.02	0	.50	.37	.01
8	0				0	0	0	0	0	0	.03	0
9	0				0	.02	0	.01	0	0	.05	0
10	0				0	.06	.08	.52	0	0	.82	0
11	0				0	*.03	0	.01	0	.08	2.86	0
12	0				0	0	.01	0	0	.01	.50	0
13	0				0	0	0	0	0	2.31	.08	0
14	0				9.17	0	*0	.40	0	*.93	0	0
15	0				.13	.27	0	1.89	0	.04	0	0
16	0				.09	.12	0	2.74	0	.02	.06	0
17	0	(*)			.16	.17	0	*.38	*0	.26	.04	0
18	0				.04	0	0	0	0	.09	0	0
19	0				0	0	*0	0	0	0	0	0
20	0				0	0	0	0	0	0	0	0
21	*0				0	0	0	0	0	0	0	0
22	0				0	0	0	0	.13	0	0	.43
23	0				0	0	0	0	.56	0	0	.08
24	0				0	0	0	0	.02	.02	0	.04
25	0				.10	0	0	0	0	.09	.04	.47
26	0				.22	0	0	0	0	.06	.02	.12
27	0				.14	0	0	0	0	0	0	.01
28	0				.06	0	0	0	0	0	0	.03
29	0				0	0	0	---	0	0	0	0
30	0				0	0	0	---	.26	0	0	0
31	0		---		---	0	0	---	.50	---	.01	---
Total	0.05	0	0	0	10.11	0.67	0.09	5.97	1.47	7.01	33.05	1.27
Mean												
Mgd	0.002	0	0	0	0.337	0.022	0.003	0.213	0.047	0.234	1.07	0.042
Cfs	0.003	0	0	0	0.521	0.034	0.005	0.330	0.073	0.362	1.66	0.065
Ac-ft	0.2	0	0	0	31	2.1	0.3	18	4.5	22	101	3.9

Calendar Year 1964: Max 13.9 Min 0 Mean mgd 0.082 Mean cfs 0.127 Ac-ft 92
Fiscal Year 1964-65: Max 26.1 Min 0 Mean mgd 0.164 Mean cfs 0.254 Ac-ft 183

Peak discharge (base, 100 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs

* Discharge measurement or observation of no flow made on this day.

8083. Finile River at Agat

Location.--Lat 13°22'41" N., long 144°39'26" E., on right bank 0.4 mile upstream from estuary and 0.4 mile southeast of Agat School.

Drainage area.--0.26 sq mi.

Records available.--April 1960 to June 1965.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 20 ft (from topographic map).

Average discharge.--5 years, 1.62 cfs.

Extremes.--Maximum discharge during year, 177 cfs Sept. 20 (gage height, 2.76 ft), from rating curve extended above 30 cfs as explained below; minimum, 0.22 cfs May 22, 23.
1960-65: Maximum discharge, 314 cfs June 6, 1963 (gage height, 3.77 ft), from rating curve extended above 30 cfs on basis of slope-area measurement at gage height 3.66 ft; minimum, 0.11 cfs June 24, 1962.

Remarks.--Records good except those for period of no gage-height record and those above 60 cfs, which are fair. No diversion above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

0.2	0.26	0.5	4.02
.3	.86	.6	6.85
.4	2.05	.7	10.6

Discharge, in cubic feet per second, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.05	0.95	0.86	1.62	1.49	0.95	5.40	1.49	0.70	0.44	0.30	0.34
2	.95	.86	4.21	1.49	1.37	.86	1.05	1.25	*.70	.44	.30	.34
3	1.15	.86	3.29	1.90	1.37	.86	.95	1.15	.78	.44	.30	.34
4	.95	1.37	1.37	1.75	*2.28	.86	.95	1.05	.70	.39	.30	.34
5	.95	.86	3.92	4.53	1.37	.86	.95	1.05	.70	.39	.30	.39
6	.95	.86	5.71	1.90	1.25	1.66	.86	.95	.62	.34	.30	.39
7	2.18	.86	1.75	2.55	1.25	1.05	.86	.95	.62	.34	.30	.44
8	1.15	.78	1.49	1.62	1.15	1.05	.86	.95	.62	.34	.30	.34
9	1.05	.86	1.49	1.49	1.15	.95	.86	.86	.62	*.39	.30	.34
10	.95	.78	1.37	1.49	1.15	.86	.86	.86	.56	.34	.30	.56
11	2.10	4.13	6.63	1.49	1.15	1.62	.86	.86	.56	.34	.30	.39
12	1.90	2.21	3.24	1.37	1.05	1.37	.78	.86	.50	.34	.30	.76
13	1.15	1.15	2.21	1.49	1.05	1.05	1.15	.78	.56	.34	.30	.73
14	.95	1.54	5.37	1.37	1.15	a 1.4	1.15	.70	.56	.34	.30	.39
15	.95	1.25	3.07	1.25	1.15	a 1.2	1.25	.78	.56	.34	.30	.34
16	.95	5.26	3.03	1.49	1.15	a .9	1.05	.95	.56	.34	.30	.34
17	.95	1.25	4.69	1.37	1.49	*.70	.95	.78	.56	.30	.30	*.30
18	.86	1.05	2.21	2.13	1.49	.78	.86	.70	.56	.30	*.26	.30
19	.86	1.05	5.26	2.38	1.62	.78	.86	.78	.56	.30	.30	.34
20	.86	3.66	6.85	1.25	1.49	.78	.78	.70	.56	.34	.30	.30
21	.95	1.37	2.92	1.49	2.49	.78	3.76	.78	.56	.30	.30	.34
22	.86	1.15	3.12	1.49	1.25	1.15	6.11	.78	.50	.30	.30	.72
23	.78	1.05	2.55	2.74	1.15	1.72	4.25	.78	.50	.30	.26	.34
24	*.78	.95	2.55	5.75	1.05	.86	1.62	.70	.50	.30	.30	.30
25	.78	.95	3.79	4.68	1.05	.78	1.25	.70	.44	.30	.30	.30
26	.78	1.05	2.55	1.75	1.05	.78	1.15	.70	.44	.30	.30	.30
27	.78	.86	2.05	1.49	1.05	.78	*1.15	.86	.44	.30	.30	.26
28	.78	*1.05	1.90	4.17	.95	.78	1.05	.70	.44	.30	.30	.26
29	.78	.95	1.75	1.75	.95	.70	7.20	---------	.44	.30	.30	.30
30	1.37	.86	1.75	1.75	.95	.70	1.37	---------	.44	.30	.30	.30
31	.86	.86	---------	1.62	---------	1.15	1.62	---------	.44	---------	.34	---------
Total	32.36	42.69	92.95	64.61	38.56	30.72	53.82	24.45	17.30	10.13	9.26	11.43
Mean	1.04	1.38	3.10	2.08	1.29	0.991	1.74	0.873	0.558	0.338	0.299	0.381
Ac-ft	64	85	184	128	76	61	107	48	34	20	18	23

Calendar year 1964: Max 14.7 Min 0.44 Mean 1.53 Ac-ft 1,110
Fiscal year 1964-65: Max 7.20 Min 0.26 Mean 1.17 Ac-ft 848

Peak discharge (base, 170 cfs)

Date	Time	Gage height	Discharge
9-20	1730	2.76	177

* Discharge measurement made on this day.
a No gage-height record.

8094. Cetti River near Umatac

Location.--Lat 13°18'58" N., long 144°39'21" E., on right bank 0.1 mile upstream from estuary and 1.3 miles northeast of Umatac School.

Drainage area.--0.72 sq mi.

Records available.--February 1960 to June 1965.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 10 ft (from topographic map).

Average discharge.--5 years, 4.48 cfs.

Extremes.--Maximum discharge during year, 1,030 cfs Sept. 17 (gage height, 4.90 ft), from rating curve extended above 66 cfs as explained below; minimum, 0.03 cfs May 11.

1960-65: Maximum discharge, 1,420 cfs Oct. 19, 1960 (gage height, 6.19 ft), from rating curve extended above 66 cfs by slope-area measurements at gage heights 1.78 and 6.19 ft; minimum, that of May 11, 1965.

Remarks.--Records good except those for period of no gage-height record, which are fair. No diversion above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Aug. 14-16)

0.09	0.05	0.7	17.0
.2	.54	.8	24.5
.3	1.80	.9	35.0
.4	4.20	1.0	50.0
.6	12.0		

Discharge, in cubic feet per second, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.60	0.80	1.12	2.20	2.20	0.80	24.8	3.05	0.70	0.46	0.18	0.11
2	1.80	1.01	3.30	1.80	2.20	.70	2.00	2.20	.80	.38	.18	.14
3	2.00	5.06	4.60	4.15	2.00	.70	1.40	*2.40	1.12	.38	.22	.14
4	1.40	2.80	1.60	3.30	4.29	.70	1.25	2.20	*.80	.38	.14	.11
5	1.40	1.80	20.2	19.4	2.40	.62	2.30	1.60	.70	.31	.26	.22
6	1.25	2.00	8.59	*3.05	2.00	.90	1.01	1.60	.62	.31	.11	.18
7	1.25	4.75	2.60	2.40	2.00	.90	.90	1.40	.80	.31	.07	.22
8	2.20	3.30	2.40	2.00	1.60	.62	.90	1.40	.62	.31	.11	.14
9	5.58	2.20	1.80	2.00	1.40	.62	.90	1.25	1.50	.26	.11	.11
10	2.00	5.27	*1.60	1.80	1.25	.62	.90	1.40	.80	.26	.11	.22
11	7.37	13.8	1.60	1.80	1.12	9.89	1.01	1.25	.70	.26	.05	.26
12	6.67	9.33	6.67	1.60	1.12	4.60	.80	1.25	.62	*.31	.09	2.44
13	2.80	3.90	3.69	1.25	1.01	1.25	7.64	1.12	.62	.38	.07	2.11
14	2.00	2.20	3.60	16.4	3.69	4.40	3.82	1.01	.62	.31	*.26	.62
15	1.80	2.60	9.84	2.40	2.00	1.80	4.50	1.01	.62	.26	.46	.38
16	1.40	22.6	4.20	2.60	1.12	1.25	2.60	1.12	.62	.26	.26	1.09
17	1.60	3.60	39.3	1.80	2.00	1.12	5.69	1.01	.62	.22	.26	1.40
18	1.25	2.60	3.30	4.18	1.60	1.01	2.00	.90	.62	.22	.22	.70
19	3.50	2.40	28.0	5.58	1.60	.90	1.40	1.01	.62	.22	.26	.54
20	1.25	12.4	6.40	2.20	a 2.2	.90	1.25	.90	.62	.22	.26	.46
21	2.50	3.38	4.20	6.14	1.60	.90	40.1	.90	.62	.31	.22	1.60
22	*1.60	2.80	5.76	2.00	4.60	3.55	29.3	.70	.62	.31	.18	1.80
23	8.45	2.00	3.60	4.34	1.60	10.8	15.9	.70	.54	.31	.18	.80
24	1.40	1.60	7.94	20.6	1.12	6.18	5.25	.70	.54	.31	.18	.62
25	5.21	*1.60	16.9	8.09	1.01	2.00	3.30	.70	.54	.26	.18	*.38
26	1.60	4.50	5.25	3.90	1.12	1.25	2.60	.70	.54	.26	.18	.38
27	1.40	2.00	3.60	2.40	1.01	1.12	2.00	1.25	.62	.26	.18	.38
28	1.40	1.60	3.30	16.3	1.01	*1.01	2.48	.70	.54	.26	.18	.38
29	1.40	1.60	2.80	7.44	.90	1.01	16.7	---------	.54	.26	.14	.38
30	13.1	1.25	2.40	6.21	.80	1.01	2.60	---------	.46	.22	.11	.38
31	1.25	1.12	---------	2.60	---------	1.40	7.73	---------	.46	---------	.11	---------
Total	90.43	127.87	210.16	161.93	53.57	64.53	195.03	35.43	20.76	8.78	5.52	18.69
Mean	2.92	4.12	7.01	5.22	1.79	2.08	6.29	1.27	0.670	0.293	0.178	0.623
Ac-ft	179	254	417	321	106	128	387	70	41	17	11	37

Calendar year 1964: Max 47.8 Min 0.16 Mean 3.56 Ac-ft 2.590
Fiscal year 1964-65: Max 40.1 Min 0.05 Mean 2.72 Ac-ft 1.970

Peak discharge (base, 800 cfs)

Date	Time	Gage height	Discharge
9-17	1330	4.90	1,030

* Discharge measurement made on this day.
a No gage-height record.

8160. Umatac River at Umatac

Location.--Lat 13°17'45" N., long 144°39'50" E., on left bank 0.2 mile upstream from mouth, 0.3 mile southeast of Umatac, and 5.7 miles northwest of Inarajan.

Drainage area.--2.04 sq mi.

Records available.--September 1952 to June 1965.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 8 ft (from topographic map). Prior to Oct. 16, 1953, at datum 0.62 ft higher.

Average discharge.--12 years (1953-1965), 8.70 cfs.

Extremes.--Maximum discharge during year, 1,700 cfs Sept. 19 (gage height, 3.72 ft), from rating curve extended above 320 cfs as explained below; minimum, 0.42 cfs June 1.

1952-65: Maximum discharge, 7,460 cfs Oct. 19, 1960 (gage height, 7.04 ft), from rating curve extended above 320 cfs on basis of slope-area measurements at gage heights 3.51 and 7.04 ft; minimum, 0.20 cfs June 23, 1960.

Remarks.--Records good except those for period of no gage-height record, which are fair. Water diverted upstream at Piga Spring for domestic use at Umatac. Continuous records of rainfall are obtained at station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

0.2	0.56	0.6	12.5
.3	1.80	.7	19.6
.4	4.00	1.0	51.0
.5	7.65	1.2	85.0

Discharge, in cubic feet per second, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	6.05	5.65	4.60	6.05	5.65	2.55	42.5	7.25	2.15	1.06	0.64	0.56
2	4.30	4.60	10.1	5.65	4.60	2.35	4.60	4.60	*2.55	1.06	.74	.64
3	5.30	18.8	6.85	6.45	4.30	2.35	3.75	4.30	2.55	1.06	.84	.56
4	3.75	8.05	4.95	10.3	*6.05	2.55	3.25	4.60	2.35	.94	.74	.56
5	5.30	5.65	42.8	29.0	4.60	2.15	3.50	3.75	2.35	.94	.94	.84
6	4.30	9.00	23.6	9.00	4.00	2.35	2.75	3.75	2.15	.94	.74	.84
7	4.60	13.4	8.05	*5.65	3.75	2.15	2.75	3.50	2.15	.94	.74	1.06
8	5.65	12.7	7.65	6.05	3.75	2.35	2.75	3.25	1.97	.94	.74	.74
9	11.7	9.98	6.45	4.95	3.75	2.15	2.75	3.25	2.35	*.84	.74	.64
10	6.45	6.45	4.95	4.60	3.50	2.35	2.75	3.25	1.97	.84	.74	.74
11	10.2	37.5	4.60	4.30	3.25	17.8	3.25	3.25	1.97	.94	.64	.74
12	10.0	23.4	7.25	4.30	3.00	7.65	2.55	3.00	1.80	.94	.64	6.23
13	5.65	9.50	6.05	4.00	3.00	3.50	20.0	2.75	1.80	.94	*.64	3.25
14	4.00	7.25	9.22	30.9	3.50	5.30	4.60	2.75	1.80	.84	.74	1.63
15	4.00	7.25	13.3	5.30	3.25	4.60	9.19	2.75	1.63	.84	1.63	1.06
16	3.25	35.1	8.50	6.05	3.00	3.00	6.05	2.75	1.63	.84	.94	2.15
17	9.82	8.05	9.94	4.60	3.25	*2.75	16.5	2.55	1.47	.84	.74	*3.00
18	4.60	6.45	9.50	23.8	3.50	2.55	7.25	2.55	1.47	.74	.74	1.47
19	4.00	6.05	72.7	16.5	3.25	2.55	4.30	2.75	1.47	.74	.74	1.18
20	3.50	33.2	19.7	7.25	4.00	2.75	3.75	2.55	1.47	.74	.74	1.18
21	3.00	12.9	11.5	11.0	4.30	2.55	83.4	2.55	1.47	.74	.74	2.55
22	3.25	10.0	15.0	6.05	9.75	3.75	66.4	2.35	1.47	.74	.64	2.75
23	3.00	7.25	11.5	9.57	3.75	10.9	38.8	2.15	1.47	.74	.64	1.63
24	2.55	6.05	27.6	24.6	3.00	10.2	12.5	2.15	1.47	.74	.64	1.18
25	62.9	5.30	48.1	22.3	3.00	5.30	8.50	2.15	1.47	.74	.64	1.06
26	3.00	*23.1	15.0	a8.0	3.00	3.75	7.25	2.15	1.18	.64	.64	.94
27	*2.55	8.05	10.5	a5.6	2.75	3.00	*5.65	2.35	1.18	.64	.74	.94
28	2.55	6.05	8.05	a10	2.55	2.75	5.65	2.15	1.18	.74	.74	.94
29	3.00	11.9	7.25	6.45	2.55	2.75	18.1	---------	1.06	.74	.64	1.06
30	55.5	6.45	6.45	10.4	2.55	2.75	5.65	---------	1.18	.64	.64	.94
31	9.50	4.95	---------	5.65	---------	3.25	6.05	---------	1.06	---------	.64	---------
Total	267.22	370.03	441.71	314.32	114.15	126.70	406.74	87.15	53.24	25.06	23.13	43.06
Mean	8.62	11.9	14.7	10.1	3.80	4.09	13.1	3.11	1.72	0.835	0.746	1.44
Ac-ft	530	734	876	623	226	251	807	173	106	50	46	85

Calendar year 1964: Max 103 Min 1.2 Mean 8.21 Ac-ft 5,960
Fiscal year 1964-65: Max 83.4 Min 0.56 Mean 6.23 Ac-ft 4,510

Peak discharge (base, 1,000 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
8-20	1830	3.45	1,410	9-19	0730	3.72	1,700
9- 5	2100	3.10	1,070	1-21	2230	3.17	1,130

* Discharge measurement made on this day.
a No gage-height record.

8210. Geus River near Merizo

Location.--Lat 13°16'15" N., long 144°40'40" E., on left bank 0.7 mile northeast of Merizo, 2.2 miles southeast of Umatac, and 4.7 miles west of Inarajan.

Drainage area.--0.95 sq mi.

Records available.--April 1953 to June 1965.

Gage.--Water-stage recorder and broad-crested weir. Altitude of gage is 60 ft (from topographic map).

Average discharge.--12 years, 3.35 cfs.

Extremes.--Maximum discharge during year, 514 cfs July 30 (gage height, 2.93 ft), from rating curve extended above 56 cfs as explained below; minimum, 0.06 cfs May 26.

1953-65: Maximum discharge, 2,940 cfs Oct. 19, 1960 (gage height, 4.16 ft), from rating curve extended above 56 cfs on basis of slope-area measurements at gage heights 4.00 and 4.16 ft; no flow for part of each day July 17, 1953, May 4, 5, 1960.

Remarks.--Records good. Water is diverted half a mile upstream for domestic use and at station for irrigation.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

0.1	0.04	0.8	5.00
.2	.18	.9	7.00
.3	.47	1.0	10.0
.4	.93	1.1	14.5
.5	1.57	1.4	34.0
.6	2.40	1.5	45.0
.7	3.52		

Discharge, in cubic feet per second, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.51	2.51	1.50	1.65	1.65	1.10	118	*2.44	0.43	0.20	0.12	0.09
2	1.22	1.82	6.75	1.57	1.50	1.10	1.57	1.50	*.55	.20	.12	.10
3	1.74	9.58	4.00	1.74	1.36	1.10	.98	1.16	.47	.20	.18	.12
4	1.22	5.00	2.51	1.74	*1.98	1.10	.77	1.04	.55	.20	.14	.10
	1.16	2.40	16.2	10.1	1.57	.98	.77	.93	.43	.20	.20	.20
6	.93	2.51	13.2	4.15	1.36	.98	.72	.77	.34	.18	.20	.23
7	.93	2.40	3.88	*2.32	1.36	1.04	.68	.77	.37	.18	.16	.31
8	.98	2.32	2.4	2.66	1.22	.87	.63	.72	.37	.18	.16	.23
9	1.56	1.90	2.15	1.82	1.16	.77	.63	.63	.47	.18	.16	.16
10	2.23	1.50	1.74	1.57	1.16	.82	.72	.63	.43	.16	.20	.20
11	1.59	16.4	1.57	1.50	1.04	4.33	.63	.72	.34	.18	.18	.23
12	3.40	15.0	2.07	1.36	1.04	2.07	.63	.68	.34	*.20	.18	2.39
13	1.98	3.64	1.90	1.29	.98	1.36	4.26	.59	.31	.23	*.18	.82
14	1.22	2.23	2.15	4.96	1.16	1.22	1.65	.59	.31	.18	.23	.37
15	1.36	1.98	4.49	1.82	1.16	1.36	2.32	.59	.28	.16	.23	.25
16	.98	20.7	3.17	1.50	1.04	1.04	2.07	.63	.31	.18	.20	.51
17	5.24	3.40	2.91	1.36	1.10	*.87	5.00	.55	.28	.16	.23	*1.10
18	2.73	2.32	2.51	5.37	1.16	.82	2.73	.51	.28	.14	.16	.34
19	1.96	1.90	23.6	6.40	1.22	.82	1.57	.63	.28	.16	.16	.23
20	1.74	16.3	5.20	2.62	1.50	.82	1.04	.59	.20	.16	.18	.28
21	1.29	6.00	3.64	4.38	1.29	.77	23.4	.51	.23	.16	.16	.72
22	1.04	3.64	3.28	2.62	2.40	1.10	40.4	.47	.23	.14	.14	.68
23	1.22	3.06	3.28	2.23	1.29	1.74	18.0	.47	.20	.14	.10	.37
24	1.22	2.23	12.0	5.78	1.04	1.04	5.20	.43	.20	.14	.12	.18
25	1.74	1.65	24.7	11.7	.98	1.22	2.51	.43	.23	.10	.10	.16
26	1.57	*7.12	6.60	2.95	1.16	.98	1.74	.43	.23	.10	.10	.16
27	1.04	3.28	3.52	2.07	1.16	.87	1.36	.47	.20	.10	.16	.16
28	*.93	2.51	2.40	2.20	1.16	.72	1.29	.43	.20	.14	.12	.23
29	1.82	1.90	1.98	1.82	1.16	.72	3.70	---------	.20	.12	.12	.23
30	43.3	1.57	1.82	2.84	1.10	.68	1.50	---------	.20	.12	.10	.18
31	5.80	1.74	---------	1.74	---------	.72	1.50	---------	.20	---------	.10	---------
Total	97.65	150.51	167.12	97.83	38.46	35.13	141.77	20.31	9.66	4.89	4.89	11.33
Mean	3.15	4.86	5.57	3.16	1.28	1.13	4.57	0.725	0.312	0.163	0.158	0.378
Ac-ft	194	299	331	194	76	70	281	40	19	9.7	9.7	22

Calendar year 1964:	Max	68.9	Min	0.28	Mean	2.99	Ac-ft	2170
Fiscal year 1964-65:	Max	43.3	Min	0.09	Mean	2.14	Ac-ft	1550

Peak discharge (base, 570 cfs).--No peak above base.

* Discharge measurement made on this day.

8350. Inarajan River near Inarajan

Location.--Lat 13°16'40" N., long 144°44'15" E., on right bank 0.6 mile northwest of Inarajan and 4.9 miles east of Merizo.

Drainage area.--4.49 sq mi.

Records available.--September 1952 to June 1965.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 15 ft (from topographic map).

Average discharge.--12 years (1953-65), 17.5 cfs.

Extremes.--Maximum discharge during year, 1,790 cfs Jan. 1 (gage height, 10.88 ft), from rating curve extended above 620 cfs on basis of velocity-area studies; minimum, 1.10 cfs May 31, June 1.
1952-65: Maximum gage height, 12.90 ft Oct. 11, 1963 (discharge not determined); minimum discharge, 0.99 cfs July 6, 7, 1960.

Remarks.--Records good except those for period of no gage-height record, which are fair. Stage-discharge relation not determined above gage height 11.0 ft owing to ungaged overbank flow. Village of Inarajan diverts about 40,000 gallons a day above station for domestic use.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

0.3	0.66	1.0	19.5
.4	1.65	1.3	41.0
.5	3.05	1.6	75.0
.6	5.00	2.0	148
.7	7.80	3.0	295

Discharge, in cubic feet per second, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	9.08	9.08	12.2	*11.8	10.0	6.00	274	9.40	4.15	3.20	2.30	1.54
2	6.90	7.50	26.2	11.8	33.2	6.00	9.40	*7.91	5.00	3.05	2.30	1.54
3	9.40	15.8	14.2	13.8	10.4	5.50	7.50	7.20	*4.55	3.05	2.60	1.65
4	6.90	14.4	11.4	12.2	14.2	6.00	6.30	7.20	4.75	3.05	2.45	1.54
5	6.60	9.70	109	52.4	10.7	5.00	7.50	6.60	4.15	2.90	2.75	2.81
6	6.90	13.4	97.6	14.6	9.08	5.25	5.50	6.30	3.95	2.90	2.45	2.76
7	6.00	12.6	15.0	11.0	9.40	5.75	5.50	6.60	4.15	2.90	2.30	2.90
8	6.90	19.8	14.6	18.3	a8.5	5.50	5.25	6.00	3.95	2.90	2.16	1.89
9	11.0	8.76	11.8	10.7	a8.0	5.25	5.50	6.00	4.55	2.90	2.02	1.77
10	10.9	8.12	10.7	10.4	a7.6	5.50	5.25	6.00	3.95	2.75	2.02	2.45
11	14.5	77.0	10.4	9.40	a7.4	48.9	5.25	6.30	3.55	3.05	2.02	2.60
12	12.6	54.6	29.0	9.08	a7.2	11.8	5.75	5.75	3.35	3.05	2.02	13.8
13	8.44	14.2	12.2	8.44	7.20	7.80	36.2	5.50	3.35	*2.75	1.89	8.38
14	6.90	10.7	11.4	8.44	8.76	8.44	8.76	5.50	3.35	2.60	2.02	2.90
15	7.50	10.4	28.1	11.0	8.12	7.50	13.0	5.50	3.35	2.45	2.60	2.16
16	6.00	82.1	16.8	8.76	7.20	6.30	11.0	5.50	3.55	2.60	2.30	*6.48
17	7.20	13.0	12.6	8.44	18.8	5.50	19.5	5.00	3.35	2.45	2.16	7.24
18	6.00	10.7	14.6	13.6	11.8	5.25	13.0	5.00	3.55	2.45	2.02	2.60
19	6.60	10.4	108	19.0	9.08	5.25	7.50	5.75	3.55	2.45	1.89	2.45
20	7.80	134	21.3	10.4	11.4	5.25	6.30	5.00	3.35	2.60	*1.65	2.16
21	5.75	22.2	16.4	20.8	10.7	5.00	192	4.75	3.35	2.60	1.89	3.35
22	5.75	16.4	15.0	10.4	14.2	7.50	135	4.75	3.35	2.45	1.77	2.90
23	6.30	12.6	15.9	18.0	8.12	*13.0	64.8	4.55	3.35	2.45	1.77	2.16
24	6.00	10.7	50.4	26.5	7.20	8.76	32.5	4.55	3.20	2.60	1.65	1.89
25	7.50	10.4	89.0	42.8	6.90	8.44	26.2	4.55	3.20	2.45	1.65	1.77
26	5.75	216	25.5	15.9	7.80	6.00	21.3	4.35	3.20	2.45	1.54	2.02
27	5.25	15.4	15.4	11.0	6.90	5.50	19.0	5.00	3.20	2.30	1.65	2.16
28	*5.50	17.7	13.4	18.3	6.30	5.50	15.4	4.15	3.20	2.60	1.65	2.16
29	8.76	15.0	12.6	15.9	6.00	5.50	14.6	---------	3.05	2.45	1.65	3.05
30	169	11.4	12.2	24.0	5.50	5.50	11.8	---------	3.05	2.30	1.54	2.16
31	14.2	*9.08	---------	10.7	---------	6.00	10.7	---------	3.05	---------	1.54	---------
Total	403.88	893.14	852.9	487.86	297.66	244.44	1,001.26	160.66	112.65	80.70	62.22	95.24
Mean	13.0	28.8	28.4	15.7	9.92	7.89	32.3	5.74	3.63	2.69	2.01	3.17
Ac-ft	801	1,770	1,690	968	590	485	1,990	319	223	160	123	189

Calendar year 1964: Max 216 Min 3.05 Mean 15.9 Ac-ft 11,560
Fiscal year 1964-65: Max 274 Min 1.54 Mean 12.9 Ac-ft 9,310

Peak discharge (base, 1,500 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
8-20	1900	9.76	1,550	1-21	2300	10.80	1,780
1- 1	0330	10.88	1,790				

* Discharge measurement made on this day.
a No gage-height record.

8400. Pauliluc River near Inarajan

Location.--Lat 13°17'05" N., long 144°45'00" E., on right bank 0.3 mile upstream from mouth, 0.9 mile northeast of Inarajan, and 3.8 miles south of Talofofo.

Drainage area.--1.86 sq mi.

Records available.--October 1952 to June 1965.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 15 ft (from topographic map).

Average discharge.--12 years (1953-65), 6.00 cfs.

Extremes.--Maximum discharge during year, 461 cfs Jan. 1 (gage height, 4.63 ft), from rating curve extended above 210 cfs as explained below; minimum, 0.43 cfs June 1.
1952-65: Maximum discharge, 2,980 cfs Oct. 15, 1953 (gage height, 13.11 ft), from rating curve extended above 210 cfs by logarithmic plotting; minimum, 0.16 cfs June 2, 1954, Apr. 27, May 1, 1955, May 18, 1956.

Remarks.--Records good. No diversion above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

0.3	0.37	0.8	7.60
.4	.78	.9	11.7
.5	1.41	1.1	23.0
.6	2.43	1.5	55.0
.7	4.40	2.0	106

Discharge, in cubic feet per second, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.00	2.66	3.80	*3.80	2.78	1.90	85.6	4.40	1.33	0.83	0.58	0.43
2	1.79	2.32	6.00	4.16	4.40	1.79	2.78	*2.78	1.57	.83	.63	.46
3	2.43	3.45	3.80	4.16	2.78	1.79	2.21	2.54	*1.49	.78	.63	.46
4	2.00	6.30	2.78	4.95	9.75	2.10	1.49	2.54	1.49	.78	.63	.50
5	1.79	4.16	29.5	15.7	3.45	1.67	2.32	2.21	1.41	.73	.68	.75
6	2.00	5.45	48.6	5.20	2.78	1.90	1.90	2.21	1.33	.73	.78	.83
7	1.67	4.62	4.95	3.45	3.45	1.79	1.79	2.10	1.49	.73	.63	.95
8	2.00	8.92	4.16	5.92	2.54	1.90	1.79	2.10	1.33	.73	.58	.73
9	2.21	3.23	3.45	3.03	2.54	1.67	1.90	2.00	1.57	.73	.58	.58
10	2.21	3.03	3.23	2.78	2.32	1.79	1.79	2.00	1.57	.68	.58	.73
11	4.52	24.2	3.03	2.66	2.32	11.1	1.67	2.10	1.33	.78	.54	.83
12	4.40	22.1	5.20	2.66	2.21	4.70	1.79	1.90	1.26	.78	.54	3.61
13	2.66	4.70	3.57	2.43	2.32	2.21	8.82	1.79	1.13	*.73	.54	6.86
14	2.00	3.80	3.57	3.03	4.58	2.10	2.66	1.79	1.13	.73	.58	1.90
15	2.21	4.16	11.4	5.17	3.80	2.10	3.23	1.79	1.13	.73	.78	1.13
16	1.79	16.7	3.80	2.78	2.32	2.00	3.03	1.79	1.07	.68	.63	*1.49
17	1.67	4.16	16.9	2.78	9.92	1.79	5.70	1.57	1.07	.73	.63	3.57
18	1.57	3.45	8.42	2.78	8.08	1.67	3.57	1.57	1.07	.78	.58	1.19
19	1.67	3.57	26.3	7.17	8.44	1.67	2.21	1.90	1.07	.78	.54	.89
20	2.00	25.7	5.20	3.45	3.45	1.57	2.00	1.57	1.07	.78	*.58	.83
21	1.57	7.48	5.45	4.95	4.70	1.57	24.1	1.49	1.01	.78	.58	1.26
22	1.57	8.93	4.16	2.78	4.95	1.90	65.1	1.49	1.01	.68	.54	1.49
23	1.49	4.40	4.70	4.35	2.66	*11.2	16.2	1.49	1.01	.73	.54	1.07
24	1.49	3.57	5.45	11.2	2.32	5.78	5.45	1.49	.95	.73	.50	.83
25	1.67	3.57	21.8	6.99	2.21	3.03	3.80	1.41	.95	.73	.50	.73
26	1.41	*21.3	10.1	3.23	2.21	2.00	3.23	1.41	.95	.63	.50	.73
27	1.41	4.40	4.16	2.78	2.00	1.90	3.80	1.57	.89	.63	.50	.68
28	*1.57	6.91	3.45	27.3	2.00	1.79	3.03	1.41	.89	.63	.58	.73
29	2.32	5.20	3.23	6.00	2.00	1.67	6.00	---------	.83	.63	.50	1.07
30	63.7	3.45	3.57	14.0	1.90	1.57	2.78	---------	.83	.63	.50	.89
31	4.40	2.78	---------	3.23	---------	1.79	3.57	---------	.83	---------	.46	---------
Total	127.19	228.67	263.73	174.87	111.18	83.41	275.31	54.41	36.06	21.85	17.94	38.20
Mean	4.10	7.38	8.79	5.64	3.71	2.69	8.88	1.94	1.16	0.728	0.579	1.27
Ac-ft	252	454	523	347	221	165	546	108	72	43	36	76

Calendar year 1964: Max 110 Min 0.81 Mean 5.37 Ac-ft 3,900
Fiscal year 1964-65: Max 85.6 Min 0.43 Mean 3.93 Ac-ft 2840

Peak discharge (base, 400 cfs)

Date	Time	Gage height	Discharge
1-1	0530	4.63	461

* Discharge measurement made on this day.

8470. Imong River near Agat

Location.--Lat 13°20'14" N., long 144°41'55" E., on left bank 500 ft upstream from Fena Valley Reservoir, 1.4 miles southwest of Fena Dam spillway, and 4.3 miles southeast of Agat School.

Drainage area.--1.93 sq mi.

Records available.--March 1960 to June 1965.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 120 ft (from topographic map).

Average discharge.--5 years, 11.1 cfs.

Extremes.--Maximum discharge during year, 1,660 cfs Aug. 20 (gage height, 6.56 ft), from rating curve extended above 110 cfs as explained below; minimum, 0.94 cfs May 31, June 1.

1960-65: Maximum discharge, 3,370 cfs Oct. 19, 1960 (gage height, 10.06 ft), from rating curve extended above 110 cfs on basis of slope-area measurements at gage heights 7.46 and 10.06 ft; minimum, that of May 31, June 1, 1965.

Remarks.--Records good. No diversion above station. Continuous records of rainfall are obtained at station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

0.3	0.64	0.8	18.7
.4	1.80	1.1	42.4
.5	4.00	1.5	88.0
.6	7.50		

Discharge, in cubic feet per second, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	8.00	5.20	5.20	5.55	5.90	3.75	37.3	7.10	*3.25	2.15	1.37	1.04
2	*6.30	4.60	8.50	*5.55	5.55	3.75	5.55	5.20	3.50	2.15	1.37	*1.14
3	6.70	8.81	10.3	7.88	5.20	3.50	4.30	4.30	3.75	2.15	1.50	1.25
4	5.20	8.93	*5.55	9.50	25.0	3.75	3.75	4.90	3.25	2.15	1.37	1.14
5	4.90	5.55	35.9	66.0	6.70	3.25	5.20	*4.00	3.00	*1.95	1.65	1.50
6	4.30	5.90	36.7	9.50	5.90	4.00	*3.50	3.75	3.00	1.95	*1.50	1.37
7	4.90	*6.30	9.50	7.10	5.55	3.50	3.50	3.50	3.00	1.95	1.37	1.37
8	4.90	6.30	7.10	6.30	4.90	3.25	3.25	3.50	3.00	1.95	1.50	1.25
9	5.20	6.30	5.90	5.90	4.60	*3.25	3.25	3.25	3.75	1.95	1.37	1.37
10	7.50	5.55	5.55	5.90	4.30	3.50	3.25	3.75	3.00	1.95	1.37	1.80
11	11.3	28.9	5.20	5.55	4.30	8.88	3.50	3.50	3.00	1.95	1.25	1.65
12	9.50	21.2	14.7	6.70	4.00	8.00	3.00	3.25	2.75	1.95	1.25	7.12
13	6.70	8.00	10.5	5.20	4.90	4.60	14.5	3.25	2.75	1.95	1.25	7.64
14	5.20	5.90	12.3	48.2	7.64	13.1	5.90	3.25	2.75	1.80	1.37	2.55
15	5.55	6.30	15.3	8.50	8.11	6.70	10.7	3.25	2.75	1.65	1.65	1.80
16	4.60	24.8	17.5	6.70	4.60	4.60	5.90	3.25	2.75	1.80	1.37	2.75
17	5.55	7.50	22.4	5.90	16.9	4.00	12.3	3.00	2.55	1.80	1.37	5.20
18	4.60	5.55	9.50	9.91	8.50	3.75	5.55	3.00	2.55	1.80	1.25	2.75
19	4.60	4.90	78.0	12.7	8.00	3.75	4.30	3.25	2.55	1.80	1.25	2.55
20	4.30	73.0	65.5	6.70	5.90	3.75	3.75	2.75	2.55	1.65	1.37	1.95
21	4.30	12.7	13.3	10.6	6.30	3.50	45.5	2.75	2.55	1.50	1.25	2.15
22	3.75	8.50	13.1	6.30	8.50	5.36	48.8	2.55	2.55	1.50	1.14	4.00
23	8.98	5.55	10.5	9.00	5.55	19.8	32.5	2.55	2.15	1.50	1.25	2.15
24	4.60	4.60	13.3	17.3	4.60	10.6	9.50	2.55	2.15	1.50	1.14	1.80
25	9.93	4.30	27.8	32.5	4.30	5.20	6.30	2.55	2.15	1.50	1.14	1.65
26	4.90	6.70	14.5	8.50	4.30	4.30	4.90	2.55	2.15	1.37	1.14	1.95
27	4.30	4.30	8.50	6.70	4.00	3.75	4.60	3.32	2.15	1.50	1.14	1.50
28	4.30	4.90	7.10	19.6	4.00	3.50	5.20	3.00	2.15	1.65	1.25	1.65
29	4.90	21.5	6.30	11.5	3.75	3.25	30.5	---------	2.15	1.50	1.04	1.50
30	23.9	6.70	5.55	15.0	3.75	3.25	6.30	---------	2.15	1.37	1.04	1.37
31	7.50	4.90	---------	6.70	---------	3.75	10.8	---------	2.15	---------	1.04	---------
Total	201.16	334.14	501.05	388.94	195.50	162.89	347.15	96.82	83.90	53.34	40.32	68.91
Mean	6.49	10.8	16.7	12.5	6.52	5.25	11.2	3.46	2.71	1.78	1.30	2.30
Ac-ft	399	663	994	771	388	323	689	192	166	106	80	137

Calendar year 1964:	Max	78.0	Min	1.95	Mean	8.17	Ac-ft	5.920
Fiscal year 1964-65:	Max	78.0	Min	1.04	Mean	6.78	Ac-ft	4.910

* Discharge measurement made on this day.

Peak discharge (base, 900 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
8-20	1830	6.56	1,660	10-14	1200	5.73	1,330
9-19	0730	5.58	1,270	10-24	2400	5.06	1,060
10- 5	1700	5.62	1,290				

8480. Almagosa Springs near Agat

Location.--Lat 13°20'45" N., long 144°40'45" E., on left bank 3.5 miles southeast of Agat and 3.5 miles northeast of Umatac.

Drainage area.--0.74 sq mi, hydrologic drainage boundary uncertain owing to ground-water exchange.

Records available.--September 1951 to June 1965.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 640 ft (from topographic map).

Average discharge.--13 years (1952-65), 3.76 cfs.

Extremes.--Maximum discharge during year, 100 cfs Aug. 20 (gage height, 2.39 ft), from rating curve extended above 53 cfs as explained below; minimum, 0.08 cfs June 8-12.
1951-65: Maximum discharge, 760 cfs Oct. 15, 1953 (gage height, 5.02 ft), from rating curve extended above 53 cfs by test on model of station site; no flow at times.

Remarks.--Records good. Up to 3.9 cfs diverted above station for municipal use.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

0.1	0.04	0.6	3.20
.2	.16	.7	5.00
.3	.48	1.0	14.2
.4	1.06	1.3	27.5
.5	1.95		

Discharge, in cubic feet per second, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.65	2.80	0.85	3.20	3.20	0.62	11.2	4.20	0.36	0.26	0.16	0.09
2	.62	1.65	2.84	2.53	3.35	.62	3.20	4.02	.36	.26	.16	.09
3	.92	2.53	5.06	3.94	2.17	.57	1.85	*3.20	.40	.26	.16	.09
4	.67	2.17	3.84	4.20	7.39	.57	1.06	2.66	.36	.26	.16	.09
5	.52	1.46	6.19	*13.9	*3.35	.57	.79	1.85	.36	.26	.16	.10
6	.48	1.21	19.8	11.1	2.53	.62	.40	1.37	.36	.23	.16	.09
7	.52	1.13	10.5	5.58	2.41	.52	.32	.99	.36	.23	.16	.10
8	.62	.85	5.87	3.84	1.75	.48	.40	.79	.36	.23	.16	.08
9	.85	1.46	3.84	3.07	1.37	.48	.40	.62	*.32	.23	.14	.08
10	.67	1.28	2.66	2.80	1.13	.48	.57	.62	.29	.23	.14	.09
11	2.39	4.86	2.05	1.95	.85	1.01	.57	.57	.29	.23	.14	.08
12	1.65	12.2	4.02	1.65	.73	.67	.52	.79	.29	.23	*.14	.30
13	1.46	7.03	2.53	1.37	.73	.52	1.02	.85	.29	*.23	.16	.73
14	.99	3.84	6.08	1.08	.99	1.64	.36	.85	.29	.20	.16	.20
15	1.55	3.67	6.16	3.84	.99	2.34	1.88	.79	.29	.20	.16	.10
16	.62	16.5	10.0	2.80	.44	.32	.62	.79	.29	.20	.16	.12
17	.36	8.48	17.4	2.17	1.09	.36	2.66	.73	.26	.20	.14	.26
18	.29	4.40	12.2	3.31	2.05	*.57	1.55	.67	.26	.20	.14	*.32
19	.32	3.07	23.0	9.64	1.37	.52	1.06	.62	.26	.18	.14	.12
20	.44	14.7	19.3	5.00	.67	.57	.57	.62	.26	.20	.14	.10
21	.62	10.5	13.9	4.20	.79	.52	1.75	.52	.26	.20	.14	.10
22	*.52	6.16	11.5	3.07	.99	.52	4.40	.48	.26	.20	.14	.10
23	5.48	4.02	8.77	2.66	.57	6.20	4.40	.40	.26	.20	.14	.36
24	1.21	3.07	7.61	6.35	.48	2.53	4.40	.32	.26	.18	.14	.20
25	1.65	2.29	13.9	14.8	.36	1.55	4.40	.36	.26	.18	.14	.14
26	.73	2.29	12.8	7.61	.36	.99	3.84	.32	.26	.18	.14	.12
27	.44	*1.46	9.64	4.40	.32	.57	2.80	.48	.26	.18	.14	.12
28	.32	1.21	6.74	6.13	.36	.32	1.95	.40	.26	.18	.14	.12
29	1.32	3.83	4.80	5.29	.52	.32	4.20	---------	.26	.16	.12	.10
30	8.06	1.75	3.67	5.58	.57	.44	4.20	---------	.26	.16	.12	.10
31	4.80	1.13	---------	3.67	---------	.57	4.20	---------	.26	---------	.12	---------
Total	42.74	133.00	257.52	160.45	43.88	28.58	71.54	30.88	9.17	6.34	4.52	4.69
Mean	1.38	4.29	8.58	5.18	1.46	0.922	2.31	1.10	0.296	0.211	0.146	0.156
Ac-ft	85	264	511	318	87	57	142	61	18	13	9.0	9.3

Calendar year 1964: Max 44.5 Min 0.01 Mean 3.28 Ac-ft 2380
Fiscal year 1964-65: Max 23.0 Min 0.08 Mean 2.17 Ac-ft 1570

Peak discharge (base, 80 cfs)

Date	Time	Gage height	Discharge
8-20	1830	2.39	100

* Discharge measurement made on this day.

8490. Fena Dam spillway near Agat

Location.--Lat 13°21'30" N., long 144°42'10" E., on left bank 4.0 miles southeast of Agat and 5.5 miles southwest of Yona.

Drainage area.--5.81 sq mi.

Records available.--September 1951 to July 1952, November 1952 to June 1965.

Gage.--Water-stage recorder and concrete-dam control. Datum of gage is 111.35 ft above mean sea level (from U.S. Navy construction plans).

Average discharge.--12 years (1953-65), 19.2 cfs.

Extremes.--Maximum discharge during year, 643 cfs Oct. 5 (gage height, 1.13 ft), from rating curve extended above 130 cfs on basis of broad-crested weir formula; no flow for many days.

1951-65: Maximum discharge, not determined, occurred Oct. 15, 1953 (gage height, at least 4.5 ft); no flow for many days each year.

Remarks.--Records fair. About 10 cfs is diverted from Fena Valley Reservoir and tributary springs for military and civilian use. Records represent only flow over spillway. Continuous records of rainfall are obtained at station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

0	0
.1	16.9
.2	47.8
.3	89.0
.6	248

Discharge, in cubic feet per second, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	31.1	7.86	4.28	19.5	28.0	0	47.8	51.5				
2	5.99	4.28	31.1	14.4	47.8	0	28.0	34.2				
3	5.99	14.4	40.9	34.2	28.0	0	12.1	*22.2				
4	5.99	19.5	28.0	79.3	98.8	0	5.99	25.1				
5	2.78	9.90	62.0	*151	*47.8	0	7.86	19.5				
6	1.50	5.99	205	79.3	25.1	0	4.28	14.4				
7	0	7.86	44.3	34.2	22.2	0	.54	14.4				
8	0	4.28	25.1	28.0	19.5	0	0	9.90				
9	0	4.28	16.9	22.2	19.5	0	0	5.99	(*)			
10	1.50	9.90	14.4	22.2	12.1	0	0	2.78				
11	12.1	31.1	12.1	16.9	12.1	.54	0	5.99				
12	25.1	83.6	31.1	19.5	9.90	16.9	0	2.78			(*)	
13	12.1	19.5	31.1	19.5	12.1	7.86	2.85	1.50		(*)		
14	4.28	9.90	81.5	126	16.9	12.1	12.1	0				
15	7.86	14.4	66.9	55.2	34.2	40.9	34.2	0				
16	1.50	93.7	70.9	25.1	16.9	12.1	12.1	0				
17	0	28.0	105	22.2	28.0	4.28	34.2	0				
18	0	12.1	66.9	31.1	70.9	.54	16.9	0				(*)
19	0	5.99	172	93.7	44.3	0	7.86	0				
20	0	109	208	37.5	22.2	0	2.78	0				
21	0	79.3	89.0	37.5	25.1	0	16.9	0				
22	0	47.8	51.5	31.1	28.0	0	62.9	0				
23	16.9	16.9	47.8	31.1	19.5	59.0	62.9	0				
24	14.4	9.90	44.3	98.4	12.1	25.1	55.2	0				
25	12.1	5.99	89.0	127	7.86	19.5	31.1	0				
26	4.28	9.90	70.9	34.2	5.99	14.4	22.2	0				
27	.54	*16.9	37.5	28.0	5.99	5.99	19.5	0				
28	.54	9.90	28.0	79.3	1.5	2.78	16.9	0				
29	7.86	42.4	19.5	51.5	.54	0	62.9	---------				
30	66.9	34.2	16.9	55.2	0	0	47.8	---------				
31	28.0	7.86	---------	28.0	---------	0	34.2	---------		---------		---------
Total	269.31	776.59	1,811.88	1,532.3	722.88	221.99	662.06	210.24	0	0	0	0
Mean	8.69	25.1	60.4	49.4	24.1	7.16	21.4	7.51	0	0	0	0
Ac-ft	534	1,540	3,590	3,040	1,430	440	1,310	417	0	0	0	0

Calendar year 1964: Max 248 Min 0 Mean 22.9 Ac-ft 16,600
Fiscal year 1964-65: Max 208 Min 0 Mean 17.0 Ac-ft 12,300

* Discharge measurement or observation of no flow made on this day.

8550. Ugum River near Talofofo

Location.--Lat 13°20'00" N., long 144°44'55" E., on left bank 0.3 mile upstream from confluence with Talofofo River, 1.3 miles south of Talofofo, and 4.2 miles north of Inarajan.

Drainage area.--6.96 sq mi.

Records available.--June 1952 to June 1965.

Gage.--Water-stage recorder and concrete control. Datum of gage is 3.23 ft above mean sea level.

Average discharge.--13 years, 29.6 cfs.

Extremes.--Maximum discharge during year, 1,380 cfs Aug. 29 (gage height, 10.10 ft, from floodmark), from rating curve extended above 910 cfs as explained below; minimum, 1.40 cfs Apr. 23.

1952-65: Maximum discharge, 7,660 cfs Dec. 4, 1963 (gage height, 12.06 ft), from rating curve extended above 910 cfs on basis of slope-area measurements at gage heights 11.30, 11.36, 11.87 and 11.90 ft; minimum, that of Apr. 23, 1965.

Remarks.--Records good except those above 200 cfs, which are fair, and those for periods of no gage-height record, which are poor. No diversion above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

0.4	2.60	1.2	53.0
.5	4.80	1.5	97.0
.6	8.00	2.0	197
.7	12.2	2.5	264
.9	24.0		

Discharge, in cubic feet per second, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	25.6	22.7	24.8	30	24.8	15.9	181	23.4	11.7	8.00	5.32	5.06
2	19.4	20.1	36.0	32	31.2	15.9	23.4	19.4	13.3	8.00	5.32	5.06
3	20.8	28.0	*27.2	34	23.4	15.4	18.2	17.5	13.3	8.00	5.92	5.32
4	18.2	31.2	24.0	36	52.3	17.0	17.0	17.0	12.2	7.65	5.92	5.32
5	16.4	23.4	97.1	50	24.0	14.8	18.2	16.4	11.7	6.95	6.60	6.25
6	17.0	24.0	149	32	22.7	16.4	15.4	16.4	10.8	6.95	5.92	8.00
7	15.4	28.8	42.0	*28.0	22.0	17.0	14.3	16.4	11.7	6.95	5.32	6.95
8	15.9	40.8	30	29.6	20.1	15.4	13.3	16.4	11.2	6.95	5.32	5.92
9	18.2	26.4	28	26.4	19.4	14.8	14.8	*15.4	12.7	6.60	5.06	5.60
10	26.9	24.8	26	27.2	18.2	14.3	13.3	15.9	12.2	6.60	4.80	6.60
11	31.5	70.8	150	24.8	17.5	44.5	16.4	17.0	10.8	6.95	4.80	6.25
12	28.8	93.0	32	28.0	17.0	30.4	12.7	15.9	*10.4	6.60	4.80	18.2
13	22.7	33.0	28	24.0	17.5	18.2	50.4	14.8	10.4	6.60	4.54	19.8
14	18.2	25.6	28	33.2	24.8	20.1	20.8	14.3	10.0	6.25	4.80	10.0
15	18.8	24.8	46	26.4	29.6	23.4	23.4	14.3	10.0	6.25	7.65	6.60
16	15.4	47.0	30	23.4	18.2	17.5	17.0	14.8	10.0	6.25	5.92	7.30
17	32.0	26.4	55	23.4	40.6	15.9	41.0	13.8	9.60	6.25	5.60	14.3
18	25.6	22.7	38	27.3	40.4	14.3	22.7	13.3	10.0	6.25	5.32	7.65
19	18.2	22.0	70	50.8	27.2	14.3	17.0	14.8	10.0	*5.92	5.32	6.25
20	18.8	68.2	150	25.6	23.4	14.3	15.9	13.3	9.60	6.25	5.60	5.92
21	15.9	48.6	34	36.0	24.8	13.8	80.4	13.3	9.20	5.92	5.60	7.30
22	15.9	39.0	30	28.0	30.4	16.4	216	12.7	9.20	5.92	5.32	8.40
23	15.9	33.0	32	28.0	23.4	26.5	103	12.7	8.80	5.32	5.32	6.25
24	15.9	31.2	34	58.2	18.2	32.5	41.0	12.2	8.80	5.60	5.32	5.32
25	24.0	28.8	65	81.0	17.5	23.4	28.0	12.2	8.80	5.92	*5.06	4.80
26	16.4	55	42	30.4	17.5	17.5	23.4	12.2	8.40	5.60	5.60	5.06
27	14.8	28	28	25.6	17.5	16.4	22.7	13.3	8.40	5.60	5.60	4.80
28	14.3	36	26	50.8	17.0	14.3	22.0	12.2	8.00	5.92	5.60	4.80
29	*14.8	200	26	33.0	16.4	13.3	66.4	---------	8.00	5.60	5.32	5.32
30	154	31.2	28	50.9	16.4	12.7	23.4	---------	8.00	5.60	5.32	5.06
31	35.4	24.0	---------	26.4	---------	12.7	22.0	---------	8.00	---------	5.06	---------
Total	761.1	1,258.5	1,456.1	1,060.4	713.4	569.3	1,214.5	421.3	315.20	193.22	168.97	219.46
Mean	24.6	40.6	48.5	34.2	23.8	18.4	39.2	15.0	10.2	6.44	5.45	7.32
Ac-ft	1,510	2,500	2,890	2,100	1,420	1,130	2,410	836	625	383	335	435

Calendar year 1964: Max 300 Min 6.25 Mean 28.0 Ac-ft 20,350
Fiscal year 1964-65: Max 216 Min 4.54 Mean 22.9 Ac-ft 16,570

Peak discharge (base, 1,400 cfs).--No peak above base.

* Discharge measurement made on this day.
Note.--No gage-height record Aug. 26-29, Sept. 8 to Oct. 6.

8580. Ylig River near Yona

Location.--Lat 13°23'20" N., long 144°45'00" E., on right bank 2 miles upstream from mouth, 2.1 miles southwest of Yona, and 5.8 miles south of Agana.

Drainage area.--6.58 sq mi.

Records available.--June 1952 to June 1965. See also Note below.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 20 ft (from topographic map).

Average discharge.--13 years, 27.9 cfs.

Extremes.--Maximum discharge during year, 3,850 cfs Sept. 14 (gage height, 17.04 ft), from rating curve extended above 620 cfs as explained below; minimum, 0.50 cfs June 2.
1952-65: Maximum discharge, 4,500 cfs Sept. 9, 1963 (gage height, 18.77 ft, from floodmark), from rating curve extended above 620 cfs on basis of slope-area measurements at gage heights 11.24 and 15.87 ft; minimum, 0.16 cfs June 18-22, 1959.

Remarks.--Records good except those for periods of no gage-height record, which are fair. No diversion above station.

Note.--Published records for high-water periods in fiscal years 1957 and 1958 have been found to be in error; revised records are on file in the district office and will be published in the next water-supply paper.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

0.2	0.45	1.0	19.6
.3	1.09	1.2	33.0
.4	2.12	1.5	64.0
.5	3.57	2.0	129
.6	5.50	4.0	408
.8	11.2		

Discharge, in cubic feet per second, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	11.6	96.4	*26.4	27.2	24	11.2	202	28	5.50	2.50	1.17	0.55
2	8.96	49.2	98.0	25.1	160	11.2	17.3	22	6.00	2.37	1.09	.50
3	14.6	25.1	134	29.4	26	10.9	14.2	20	5.75	2.24	1.36	.66
4	11.6	22.0	34.8	27.2	28	10.9	12.7	*16.8	5.30	2.24	1.36	.66
5	12.7	22.6	204	103	20	19.6	13.1	15.0	5.10	2.12	1.46	.80
6	10.6	19.1	206	31.5	22	25.7	11.2	14.2	4.70	2.00	1.36	1.17
7	25.2	22.0	44.2	*29.4	18	14.6	10.9	13.5	4.90	1.88	1.26	2.37
8	21.3	29.4	41.1	27.2	20	13.1	9.92	12.7	5.10	1.88	1.09	1.88
9	21.6	20.2	33.9	18.7	22	11.2	9.60	12.3	5.10	1.88	1.01	1.09
10	20.0	41.2	37.5	20	15	11.2	9.92	12.0	*5.10	1.77	1.09	.87
11	60.5	31.5	127	24	14	28.6	10.2	11.6	4.30	1.77	1.01	1.09
12	280	179	81.7	18	13	33.0	10.6	10.9	4.10	1.77	.94	5.84
13	33.0	47.5	33.0	17	13	27.9	17.3	9.92	3.91	1.77	.94	4.50
14	23.9	111	360	22	15	17.3	20.8	9.60	3.91	1.66	.94	2.50
15	22.0	47.5	42	17	16	14.6	15.0	9.60	3.74	1.56	1.01	1.66
16	17.8	64.4	40	22	14	17.3	11.2	10.6	3.74	*1.56	1.01	1.26
17	36.4	34.8	36	15	250	13.1	67.3	8.96	3.57	1.66	.94	1.46
18	17.3	26.4	34.8	20	46	12.0	184	8.64	3.40	1.56	.87	1.36
19	42.3	72.0	338	70	28	11.2	60.6	8.64	3.74	1.56	.80	1.26
20	21.4	29.4	390	17	26	11.2	19.1	8.32	3.40	1.46	1.01	1.66
21	15.0	73.3	154	48	25.7	11.2	57.9	8.00	3.24	1.56	*1.17	1.46
22	14.6	64.3	57.4	20	28.6	106	24.5	7.75	3.08	1.46	1.01	10.2
23	33.5	29.4	66.1	100	17.3	246	28	7.50	2.93	1.46	.87	4.10
24	14.6	25.1	68.2	130	15.0	27.2	34	7.00	2.93	1.56	.80	2.37
25	26.1	20.8	84.8	90	15.0	18.7	20	6.50	2.78	1.46	.73	1.77
26	169	73.0	92.4	24	15.0	17.3	18	6.25	2.64	1.26	.73	1.77
27	19.6	24.5	43.1	20	14.2	13.9	15	6.50	2.50	1.26	.73	1.56
28	18.7	49.2	36.6	100	13.1	13.1	14	6.50	2.50	1.26	.80	1.66
29	*43.4	69.2	33.0	25.7	12.0	13.1	220	---------	2.37	1.26	.80	1.88
30	191	245	29.4	24.5	11.2	*11.2	24	---------	2.37	1.17	.73	*2.00
31	39.3	33.0	---------	22	---------	12.7	32	---------	2.24	---------	.66	---------
Total	1,297.56	1,697.5	3,007.4	1,184.9	957.1	816.2	1,214.34	319.28	119.94	50.92	30.75	61.91
Mean	41.9	54.8	100	38.2	31.9	26.3	39.2	11.4	3.87	1.70	0.992	2.06
Ac-ft	2,570	3,370	5,970	2,350	1,900	1,620	2,410	633	238	101	61	123

Calendar year 1964: Max 436 Min 1.66 Mean 36.6 Ac-ft 26,550
Fiscal year 1964-65: Max 390 Min 0.50 Mean 29.5 Ac-ft 21,350

Peak discharge (base, 2,000 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
7-26	1400	11.84	2,200	9-19	0900	14.03	2,860
8-30	1200	13.35	2,640	9-20	2100	13.07	2,560
9-14	1400	17.04	3,850				

* Discharge measurement made on this day.
Note.--No gage-height record Sept. 14-17, Oct. 10-28, Oct. 31 to Nov. 20, Jan. 23 to Feb. 3.

8650. Pago River near Ordot

Location.--Lat 13°26'10" N., long 144°45'15" E., on left bank 0.8 mile south of Ordot, 2.5 miles south of Agana, and 3.6 miles southeast of Asan.

Drainage area.--6.18 sq mi.

Records available.--September 1951 to June 1965. See also Note below.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 25 ft (from topographic map).

Average discharge.--13 years (1952-65), 25.9 cfs.

Extremes.--Maximum discharge during year, 3,810 cfs July 26 (gage height, 13.44 ft, from floodmarks), from rating curve extended above 320 cfs as explained below; minimum, 0.18 cfs May 31 to June 2.
1951-65: Maximum discharge, 9,470 cfs Aug. 2, 1962 (gage height, 18.87 ft, from floodmarks), from rating curve extended above 320 cfs on basis of slope-area measurements at gage heights 13.22, 15.07 and 18.87 ft; no flow June 5-7, 10-23, 1959.

Remarks.--Records good except those for periods of no gage-height record, which are poor. No diversion above station.

Note.--The figures of maximum discharge for fiscal years 1954 and 1958 have been found to be in error; revised figures are on file in the district office and will be published in the next water-supply paper.

Revisions.--Revised figures of discharge, in cubic feet per second, for the fiscal year 1964, superseding those published in Surface Water Records of Hawaii and other Pacific Areas (1964), are given herewith:

1964		1964-Con.	
June 24	13.2	June 28	12.8
25	96.8	29	11.0
26	21.0	30	20.2
27	31.8		

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
June 1964	375.3	96.8	3.0	12.5	744

Discharge, in cubic feet per second, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	13.5	75	22.8	14.9	14.2	5.30	134	19.3	3.34	1.50	0.68	0.18
2	8.90	36	36.0	19.3	133	4.94	10.5	14.2	3.96	1.50	.68	.18
3	38.8	16	112	22	15.6	4.94	7.90	11.6	3.64	1.32	.68	.29
4	14.9	14	25.5	18	16.3	4.94	7.90	*10.5	3.64	1.32	.68	.35
5	11.0	15	177	80	12.2	4.28	8.40	8.90	3.64	1.32	.78	.42
6	9.40	12	128	*12	12.8	17.0	7.45	8.40	2.80	1.32	.68	1.03
7	24.7	14	32.7	19.3	10.5	8.40	7.00	8.40	2.80	1.32	.58	.58
8	11.0	20	25.5	19.3	12.2	7.00	6.55	7.45	3.64	1.16	.49	.49
9	9.40	12	23.7	14.2	13.5	5.30	7.00	7.45	3.64	1.16	.49	.42
10	11.0	30	20.1	14.2	7.90	4.60	6.55	7.00	*3.06	1.16	.42	.42
11	31.8	20	*200	16.3	7.45	33.2	7.00	7.00	2.56	1.03	.42	.35
12	220	140	125	13.5	7.00	46.8	5.30	6.55	2.56	1.03	.35	1.90
13	20	34	31.6	12.2	7.00	7.90	10.5	6.10	2.56	1.03	.35	3.06
14	17	90	37.2	15.6	7.45	8.40	8.40	5.70	2.32	1.03	.49	1.70
15	15	36	38.4	12.2	8.40	7.00	10.5	6.55	2.32	1.03	.49	.90
16	11	48	30.5	14.2	7.00	9.95	6.55	6.55	2.10	*1.16	.42	.68
17	26	26	42.0	8.90	226	5.70	14.2	5.70	1.90	1.03	.35	.8
18	10	18	45.8	12.8	38.7	5.30	7.00	5.30	1.90	.90	.35	*.68
19	28	55	67.6	55.9	17.8	4.94	5.30	4.94	2.32	.78	.29	.78
20	12	20	158	12.2	16.3	4.60	4.94	4.60	1.90	.90	*.49	.90
21	8.5	60	46.2	37.3	13.5	4.28	68.4	4.60	1.70	.78	.49	1.03
22	7.0	48	36.0	12.8	17.0	162	151	4.94	1.70	.90	.42	2.10
23	*22	20	85.5	78.7	8.40	52.3	83.4	4.60	1.70	1.03	.35	1.16
24	11.0	16	65.5	104	7.90	32.9	24.6	4.60	1.50	1.03	.58	.68
25	50.1	13	109	71.5	7.45	21.0	14.2	4.60	1.50	.78	.58	.49
26	140	50	44.8	16.3	14.2	10.5	12.8	4.60	1.50	.58	.35	.49
27	13	16	28.5	13.5	7.45	8.40	9.95	6.10	1.50	.68	.35	.58
28	12	36	21.9	84.4	7.00	8.40	9.40	3.96	1.32	.78	.35	.68
29	30	266	19.3	17.0	6.55	7.45	187	---------	1.32	.68	.35	.78
30	150	201	21.0	21.0	5.70	*6.55	17.8	---------	1.32	.68	.29	.9
31	28	32.7	---------	12.8	---------	8.40	21.9	---------	1.32	---------	.23	---------
Total	1015.00	1489.7	1857.1	876.30	686.45	522.67	883.39	200.19	72.98	30.92	14.50	25.00
Mean	32.7	48.1	61.9	28.3	22.9	16.9	28.5	7.15	2.35	1.03	0.468	0.833
Ac-ft	2010	2950	3680	1740	1360	1040	1750	397	145	61	29	50

Calendar year 1964: Max 400 Min 1.32 Mean 28.3 Ac-ft 20560
Fiscal year 1964-65: Max 266 Min 0.18 Mean 21.0 Ac-ft 15210

Peak discharge (base, 3,000 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
7-26	1400	13.44	3,810	11-17	1000	12.30	3,350
8-29	1630	12.15	3,290				

* Discharge measurement made on this day.
Note.--No gage-height record July 12-23, July 26 to Aug. 28, Oct. 3-6, June 17, 30.

8752. Benoki-gawa at Benoki

Location.--Lat 26°47'06" N., long 128°14'59" E., on left bank 0.9 mile southeast of Benoki and 1.6 miles east of Sate.

Drainage area.--3.8 sq mi, approximately.

Records available.--December 1963 to June 1965.

Gage.--Water-stage recorder. Altitude of gage is 220 ft (from topographic map).

Extremes.--Maximum discharge during year, 2,190 cfs June 23 (gage height, 6.90 ft), from rating curve extended above 100 cfs as explained below; minimum, 3.88 cfs Dec. 7.

1963-65: Maximum discharge, 4,360 cfs June 16, 1964 (gage height, 8.40 ft), from rating curve extended above 100 cfs by logarithmic plotting; minimum, that of Dec. 7, 1964.

Minimum discharge known, 3.20 cfs Oct. 30, 1963, result of discharge measurement.

Remarks.--Records good except those above 200 cfs, which are fair. No diversion above station. Sediment samples for high flows and continuous records of rainfall are obtained at station.

Rating tables (gage height, in feet, and discharge, in cubic feet per second)

July 1 to Jan. 3				Jan. 4 to June 30			
0.78	3.95	2.2	35.3	0.8	4.10	3.0	108
.8	4.10	2.5	56.0	1.2	8.90	3.5	190
1.1	6.80	3.0	108	1.7	17.5	4.0	310
1.5	12.6	3.5	190	2.0	27.0	4.5	475
1.9	23.0			2.5	57.0		

Discharge, in cubic feet per second, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	19.4	7.16	10.3	12.1	5.33	4.17	7.40	7.72	7.12	7.60	9.46	22.6
2	18.0	6.80	8.98	9.14	5.33	4.02	7.04	6.40	9.00	8.51	48.4	25.2
3	16.6	7.99	8.28	7.40	5.24	4.40	99.0	6.16	7.24	19.2	110	73.5
4	15.7	7.86	8.00	7.64	6.20	4.75	89.9	6.04	6.88	47.2	19.8	36.0
5	14.7	6.30	7.52	7.40	12.3	3.95	22.5	7.30	6.40	17.1	16.8	55.2
6	14.1	6.20	7.28	7.04	5.52	3.95	*19.4	10.2	8.53	13.4	16.5	213
7	13.2	6.40	7.04	6.92	5.24	5.09	19.1	6.28	24.9	11.6	16.0	73.1
8	12.4	6.10	6.92	*22.6	5.06	*27.6	17.7	5.80	12.0	10.8	20.9	50.5
9	11.9	5.61	6.70	26.8	4.98	13.3	14.9	5.56	10.8	10.2	41.9	40.2
10	11.4	5.43	8.68	12.9	4.98	32.9	13.8	6.40	8.90	31.1	89.3	33.9
11	10.8	5.61	6.80	9.70	4.81	22.6	12.6	5.80	8.25	14.5	40.1	30.4
12	10.3	6.56	6.30	8.42	4.72	14.7	12.0	5.44	7.86	12.0	29.9	42.5
13	10.0	5.80	6.00	43.5	4.56	8.26	11.4	5.09	7.36	48.9	45.6	32.0
14	9.26	5.33	*5.80	14.9	4.48	6.40	10.6	4.98	7.12	18.8	33.5	25.9
15	8.98	5.15	5.70	11.1	4.48	5.89	10.2	4.98	6.88	15.3	52.0	160
16	8.98	5.43	5.70	11.1	4.40	10.3	9.74	4.87	8.19	13.6	62.1	44.6
17	11.7	31.2	5.61	10.2	4.40	113	9.32	4.98	6.40	12.8	*37.6	*31.8
18	8.65	14.0	6.00	8.70	4.40	35.3	9.04	5.20	6.28	20.6	31.8	27.5
19	7.76	7.40	5.52	8.00	4.48	19.9	8.77	4.98	6.16	15.8	32.5	24.3
20	19.7	6.70	5.24	7.76	4.40	15.4	8.38	112	6.04	*13.4	27.5	25.9
21	9.18	34.3	5.52	7.52	4.32	12.6	8.12	17.0	5.92	12.4	95.0	350
22	7.64	125	5.24	7.28	4.32	11.4	7.86	10.3	6.50	11.6	121	65.8
23	7.52	65.6	5.15	7.04	4.32	10.4	7.73	11.1	9.12	11.4	154	270
24	7.04	24.2	5.15	7.61	*4.25	9.40	7.60	10.1	*10.0	11.2	83.9	83.4
25	7.60	18.6	4.98	6.60	4.10	8.70	7.36	*8.12	7.24	10.6	54.9	54.3
26	11.1	*15.4	6.02	6.20	4.10	9.40	7.12	7.60	7.00	10.2	*44.2	44.8
27	62.4	13.6	7.33	6.20	4.02	14.7	*7.12	7.48	6.28	9.74	36.0	40.8
28	*12.8	12.1	5.15	6.00	3.95	9.40	6.88	7.60	5.92	9.32	30.8	44.8
29	9.40	11.1	118	*5.61	4.56	8.28	6.88	---------	6.50	14.4	27.5	34.4
30	8.28	10.3	33.1	5.52	4.81	8.00	7.24	---------	21.1	11.7	24.7	*29.9
31	7.76	9.55	---------	5.43	---------	8.99	6.52	---------	8.77	---------	22.9	---------
Total	404.25	498.78	334.01	324.33	148.06	467.15	493.22	305.48	266.66	474.97	1476.56	2086.3
Mean	13.0	16.1	11.1	10.5	4.94	15.1	15.9	10.9	8.60	15.8	47.6	69.5
Ac-ft	802	989	662	643	294	927	978	606	529	942	2930	4140

Calendar year 1964:	Max	413	Min	3.95	Mean	19.7	Ac-ft	14260
Fiscal year 1964-65:	Max	350	Min	3.95	Mean	19.9	Ac-ft	14440

* Discharge measurement made on this day.

Peak discharge (base, 1,300 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
8-22	1900	6.69	1,970	6-23	about 2000	6.90	2,190
6-21	about 1100	-	-				

8755. Yona-gawa at Yona

Location.--Lat 26°45'10" N., long 128°13'18" E., on left bank 0.9 mile southeast of Yona and 2.7 miles east of Hentona School.

Drainage area.--1.7 sq mi, approximately.

Records available.--December 1963 to June 1965.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 150 ft (from topographic map).

Extremes.--Maximum discharge during year, 1,510 cfs June 23 (gage height, 4.88 ft), from rating curve extended above 65 cfs; minimum, 2.00 cfs on several days in November and December.

1963-65: Maximum discharge, 1,520 cfs June 16, 1964 (gage height, 4.90 ft), from rating curve extended above 65 cfs; minimum, 1.95 cfs Apr. 22-28, 1964.

Remarks.--Records good except those above 200 cfs, which are fair. No diversion above station. Daily sediment samples and continuous records of rainfall are obtained at station.

Rating tables (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 12-24)

July 1 to Aug. 22

0.9	2.08	1.3	16.4
1.0	3.78	1.4	24.5
1.1	6.35	1.7	59.2
1.2	10.3		

Aug. 23 to June 30

0.87	2.00	1.4	25.0
1.0	4.20	1.7	59.2
1.1	7.15	2.0	111
1.2	11.5	2.3	182

Discharge, in cubic feet per second, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	7.70	4.45	5.30	3.80	2.55	2.13	2.70	2.68	3.20	3.02	4.00	10.0
2	7.35	4.20	5.00	3.20	2.70	2.00	2.55	2.55	3.39	3.20	17.9	26.0
3	6.35	4.75	5.00	3.02	2.70	2.25	28.0	2.40	3.20	7.55	51.0	47.1
4	6.35	4.70	4.45	3.20	3.02	2.25	37.3	2.40	3.02	12.6	10.5	18.9
5	5.45	3.78	4.20	3.20	6.90	2.00	8.80	2.85	2.85	6.50	8.30	26.0
6	5.45	3.78	4.00	3.59	2.85	2.00	*7.15	4.04	3.39	5.00	7.50	67.8
7	5.20	3.57	3.80	3.59	2.70	2.00	6.80	2.70	8.10	4.20	7.50	32.0
8	4.95	3.57	3.59	19.7	2.55	*3.18	6.50	2.40	4.70	4.00	7.15	21.8
9	4.70	3.37	3.59	10.1	2.40	3.31	5.30	2.40	4.45	3.80	13.1	17.5
10	4.85	3.37	16.4	5.30	2.40	6.98	4.70	2.85	3.80	8.26	51.1	15.1
11	4.45	3.18	5.00	4.20	2.40	*7.66	4.20	2.55	3.39	5.60	20.3	12.6
12	4.20	3.37	3.80	3.80	2.25	3.20	4.00	2.40	3.20	4.20	13.2	17.8
13	4.00	3.78	3.59	7.53	2.25	2.55	3.80	2.25	3.20	18.9	13.2	13.8
14	3.78	3.00	*3.39	5.00	2.25	2.25	3.59	2.25	3.02	8.30	13.4	11.5
15	3.78	2.84	3.59	4.00	2.25	2.13	3.59	2.25	3.02	6.20	24.4	56.1
16	4.00	3.16	3.39	4.00	2.25	7.16	3.39	2.13	3.59	5.30	34.7	21.0
17	5.58	29.1	3.39	3.80	2.25	33.7	3.20	2.25	3.02	5.00	*18.9	*14.4
18	3.57	8.20	3.20	3.39	2.13	9.98	3.20	2.25	2.85	10.7	15.1	11.5
19	3.37	5.20	3.20	3.20	2.13	5.00	3.20	2.25	2.85	7.90	15.7	10.0
20	19.3	4.70	3.20	3.20	2.13	3.80	3.02	71.3	2.85	*6.20	13.2	12.6
21	4.45	12.0	3.20	3.39	2.13	3.39	3.02	11.0	2.70	*5.30	61.8	176
22	3.57	53.4	3.20	3.02	2.13	3.20	2.85	5.60	2.85	5.00	79.9	33.0
23	3.57	29.9	3.02	3.20	2.13	3.02	2.85	5.00	3.02	4.70	58.3	166
24	3.37	13.2	3.02	3.20	*2.00	2.85	2.70	4.45	*3.54	4.45	39.4	55.2
25	4.38	10.0	2.85	3.02	2.13	2.85	2.70	*3.80	3.02	4.20	*25.0	30.0
26	5.32	*8.30	3.59	2.85	2.13	3.80	2.70	3.39	3.02	4.00	20.3	23.4
27	53.7	7.15	4.20	3.02	2.00	6.20	*2.70	3.39	2.85	4.00	16.9	20.3
28	*9.19	6.80	3.02	2.85	2.00	3.59	2.70	3.39	2.70	3.80	13.8	23.4
29	6.35	6.20	10.2	*2.70	2.25	3.02	2.70	---------	3.02	6.67	12.0	17.5
30	5.20	5.90	7.20	2.70	2.40	2.85	2.85	---------	6.20	5.30	11.0	*15.1
31	4.95	5.60	---------	2.70	---------	3.02	2.55	---------	3.39	---------	9.50	---------
Total	218.43	264.52	134.58	133.47	74.36	143.32	175.31	159.17	107.40	183.85	708.05	1,023.4
Mean	7.05	8.53	4.49	4.31	2.48	4.62	5.66	5.68	3.46	6.13	22.8	34.1
Ac-ft	433	525	267	265	147	284	348	316	213	365	1,400	2,030

Calendar year 1964: Max 162 Min 1.95 Mean 9.10 Ac-ft 6,610
Fiscal year 1964-65: Max 176 Min 2.00 Mean 9.11 Ac-ft 6,590

* Discharge measurement made on this day.

Peak discharge (base, 700 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
6-21	0800	4.16	1,020	6-23	1530	4.88	1,510

8762. Takazato-gawa near Hama

Location.--Lat 26°41'10" N., long 128°10'48" E., on right bank 2.3 miles southeast of Hama and 3.0 miles south of Okuma.

Drainage area.--0.9 sq mi, approximately.

Records available.--December 1963 to June 1965.

Gage.--Water-stage recorder. Altitude of gage is 400 ft (from topographic map).

Extremes.--Maximum discharge during year, 1,550 cfs June 23 (gage height, 5.60 ft), from rating curve extended above 3.1 cfs; minimum, 0.76 cfs Dec. 2, 4-8.
1963-65: Maximum discharge, 2,040 cfs June 16, 1964 (gage height, 6.10 ft), from rating curve extended above 44 cfs; minimum, 0.76 cfs Dec. 2, 4-8, 1964.

Remarks.--Records fair except those above 100 cfs, which are poor. No diversion above station. Sediment samples for high flows and continuous records of rainfall are obtained at station.

Rating tables (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used July 1 to Aug. 17, Oct. 8 to Jan. 4)

July 1 to Oct. 8		Oct. 9 to June 30	
1.3	0.98	1.02	0.76
1.4	2.50	1.1	1.96
1.5	4.82	1.2	4.15
1.6	8.03	1.3	7.15
1.7	12.2	1.5	15.0
1.9	23.7	1.8	32.2
		2.2	66.0

Discharge, in cubic feet per second, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	4.82	2.70	3.30	1.33	1.01	0.88	0.88	1.30	1.61	1.45	2.55	7.52
2	*4.27	2.30	3.10	1.05	1.01	.76	.88	1.15	1.61	1.61	3.80	16.2
3	4.00	12.2	2.90	.98	1.15	1.01	5.46	1.15	1.61	3.42	9.48	15.6
4	4.00	*4.72	2.90	1.18	1.46	.88	8.52	1.01	1.45	3.65	4.15	10.1
5	3.73	3.10	2.70	.98	4.03	.76	3.19	1.30	1.45	2.75	3.65	12.1
6	3.50	2.70	2.50	.98	1.61	.76	2.98	1.96	1.78	2.15	3.65	15.5
7	3.30	2.30	2.50	1.18	1.45	.76	2.98	1.15	3.30	1.96	3.90	12.9
8	3.30	2.10	2.50	*5.81	1.45	1.15	*2.55	1.15	2.55	1.96	3.42	10.4
9	3.10	1.93	2.30	3.90	1.45	1.30	2.15	1.15	2.15	1.78	4.40	9.34
10	2.90	2.10	3.10	2.35	1.30	1.78	2.15	1.45	1.96	2.98	9.36	8.24
11	2.90	1.93	2.30	1.96	1.30	*1.80	1.96	1.15	1.78	2.15	6.80	7.15
12	2.70	1.93	2.10	1.78	1.15	1.15	1.78	1.01	1.61	1.78	5.25	8.98
13	2.50	2.10	1.93	2.75	1.15	1.01	1.61	1.01	1.61	5.24	4.95	7.52
14	2.50	1.75	1.93	2.35	1.15	.88	1.61	.88	1.45	2.98	4.84	6.45
15	2.50	1.60	1.75	2.15	1.15	.88	1.78	.88	1.45	2.55	6.55	15.3
16	2.50	2.10	*1.75	2.35	1.15	2.66	1.78	88	1.96	2.35	12.0	13.7
17	2.70	13.0	1.75	1.96	1.15	11.3	1.61	1.01	1.45	2.35	7.15	*11.2
18	2.30	6.90	1.93	1.78	1.15	3.65	1.61	1.01	1.45	5.74	5.55	9.70
19	1.93	5.10	1.48	1.78	1.30	1.96	*1.45	.88	1.30	3.65	5.55	8.61
20	5.27	4.55	1.33	1.78	1.15	1.45	1.30	11.4	1.30	3.19	4.95	10.0
21	2.90	7.92	1.33	1.78	1.01	1.30	1.15	4.15	1.30	*2.98	14.8	31.8
22	2.50	9.14	1.33	1.78	1.01	1.30	1.15	2.55	1.45	2.55	24.2	16.0
23	3.10	11.6	1.33	1.61	1.01	1.15	1.15	2.55	1.45	2.55	22.6	58.0
24	2.50	7.65	1.33	1.61	*1.01	1.01	1.15	2.35	*1.96	2.35	18.5	18.0
25	4.13	6.23	1.33	1.61	1.01	1.01	1.15	*1.96	1.30	2.35	14.2	12.1
26	4.84	5.10	1.48	1.45	.88	1.15	1.15	1.78	1.45	2.35	*13.4	9.70
27	17.6	4.55	1.48	1.45	.88	1.45	1.15	1.78	1.30	2.35	11.2	8.47
28	5.10	*4.00	1.18	1.45	.88	1.15	*1.15	1.78	1.15	2.15	9.70	10.7
29	3.50	3.73	3.10	*1.30	1.01	1.01	1.15	---------	1.61	3.90	8.61	7.88
30	3.10	3.50	1.93	1.30	1.01	1.01	1.30	---------	2.35	2.98	7.88	6.45
31	2.90	3.30	---------	1.15	---------	1.01	1.15	---------	1.61	---------	7.15	---------
Total	116.89	143.83	61.87	56.87	37.43	49.33	61.03	51.78	51.76	82.20	264.19	395.61
Mean	3.77	4.64	2.06	1.83	1.25	1.59	1.97	1.85	1.67	2.74	8.52	13.2
Ac-ft	232	285	123	113	74	98	121	103	103	163	524	785

Calendar year 1964: Max 102 Min 0.76 Mean 4.24 Ac-ft 3080
Fiscal year 1964-65: Max 58.0 Min 0.76 Mean 3.76 Ac-ft 2720

* Discharge measurement made on this day.

Peak discharge (base, 200 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
8-3	1830	3.83	432	6-23	1700	5.60	1,550

8770. Right Branch of South Fork Henan-gawa near Tsuha

Location.--Lat 26°37'42" N., long 128°05'52" E., on right bank 1.6 miles upstream from Henan-gawa bridge at Highway 1 and 1.6 miles south of Tsuha.

Drainage area.--0.7 sq mi, approximately.

Records available.--November 1963 to June 1965.

Gage.--Water-stage recorder and since May 14, concrete control. Altitude of gage is 50 ft (from topographic map).

Extremes.--Maximum discharge during year, 455 cfs May 22 (gage height, 3.55 ft), from rating curve extended above 150 cfs on basis of slope-area measurement at gage height 5.46 ft; minimum, 0.54 cfs on many days.

1963-65: Maximum discharge, 1,600 cfs (revised) June 16, 1964 (gage height, 6.47 ft), from rating curve extended above 38 cfs; minimum, 0.35 cfs Dec. 1, 1963.

Revisions.--The maximum discharge for the period November 1963 to June 1964 has been revised to 1,600 cfs June 16, 1964 (gage height, 6.47 ft), superseding figure published in Surface Water Records of Hawaii and other Pacific Areas (1964).

Remarks.--Records fair. No diversion above station. Sediment samples for high flows and continuous records of rainfall are obtained at station.

Revisions.--The revised figure of discharge, in cubic feet per second, for a day in the fiscal year 1964, superseding that published in Surface Water Records of Hawaii and other Pacific Areas (1964), is given herewith:

June 16, 1964..... 72.3

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
June 1964	320.48	72.3	2.75	10.7	636

Revised peak discharge.--1964: Jan. 28 (0600) 184 cfs (3.12 ft); June 16 (1400) 1,600 cfs (6.47 ft).

Rating tables (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Feb. 20 to May 13)

July 1 to May 13

0.92	0.54	1.3	5.05
1.0	1.00	1.4	7.40
1.1	1.91	1.6	14.1
1.2	3.25	1.9	30.5

May 14 to June 30

1.1	1.94	1.5	11.9
1.2	3.20	1.7	22.7
1.3	5.05	1.9	39.0
1.4	8.00	2.2	75.0

Discharge, in cubic feet per second, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.80	1.70	1.07	1.40	0.64	0.69	0.80	0.69	0.74	0.69	0.74	2.98
2	2.39	1.60	1.00	.93	.80	.69	.74	.59	.86	.74	2.24	8.27
3	2.39	1.60	.93	.80	.64	*.74	4.85	.59	.74	1.23	10.1	10.1
4	2.26	1.60	.93	.86	.69	.69	9.15	.59	*.69	1.23	1.56	*3.86
5	2.14	1.40	.86	.80	2.38	.54	*1.50	*.69	.69	*1.07	1.40	11.8
6	2.02	1.31	.86	*.74	.74	.54	1.23	.80	.93	.74	1.40	13.1
7	1.91	1.31	.86	.80	.69	.54	1.23	.69	1.50	*.69	1.70	6.52
8	1.80	1.31	.80	7.86	.69	.80	1.23	.69	1.07	.59	2.34	5.05
9	1.80	1.23	.80	2.35	.69	1.06	1.07	.69	.93	.59	6.10	4.04
10	1.70	1.15	1.02	1.07	.69	1.23	1.00	.86	*.74	1.23	9.68	3.68
11	1.60	1.15	.86	.80	*.64	1.07	1.00	.74	.69	.86	5.09	3.36
12	1.50	1.15	.80	.74	.64	.74	.80	*.69	.59	.69	3.14	4.04
13	1.40	1.23	.74	1.91	.59	.59	.80	.59	.59	5.61	2.62	3.85
14	*1.31	1.07	.69	*1.66	.59	.54	.80	.59	.54	1.60	*2.59	3.05
15	1.31	1.07	.74	.86	.59	*.54	.80	.59	.54	1.07	4.43	23.7
16	1.23	1.07	*.69	.80	.59	2.24	.80	.59	*.86	.93	17.7	*7.99
17	1.50	2.52	.69	.74	.59	*12.7	.80	.69	.54	.86	4.62	4.62
18	1.31	1.23	.64	.74	.59	2.52	.74	*.59	.54	3.73	*3.68	3.85
19	1.15	1.07	.59	.74	.59	1.40	.74	.54	.54	2.00	3.85	3.52
20	3.35	*1.07	.59	*.69	.59	1.23	.74	28.5	.54	1.23	3.20	11.7
21	1.50	1.40	.59	.69	.59	1.15	.74	3.21	.54	1.15	26.4	*62.0
22	1.31	1.15	.59	.69	.59	1.07	.74	1.50	.86	1.07	57.2	11.9
23	1.60	1.07	.59	.69	.59	.86	.74	1.50	.74	.93	24.0	*22.8
24	1.23	1.00	.59	.69	.59	.86	.74	1.23	.86	.93	12.9	15.8
25	1.23	.93	.59	.69	.59	.86	.74	1.07	.69	.93	7.70	9.56
26	1.96	.88	.64	.64	.59	.86	.74	.93	.74	.86	6.62	7.41
27	*27.9	.93	.86	.64	.54	1.07	.69	.93	.59	.86	*4.83	7.50
28	3.09	.93	.74	.64	.54	.80	.69	.86	.54	.74	4.04	9.11
29	2.26	.93	2.99	.64	.80	.80	.69	---------	.69	1.31	3.52	5.64
30	1.91	.93	*4.74	.59	.80	.80	.80	---------	1.59	1.23	3.20	4.62
31	1.70	.93	---------	.59	---------	.86	.69	---------	.86	---------	2.90	---------
Total	82.56	37.92	29.08	34.48	20.87	41.08	38.82	52.22	23.56	37.39	241.49	295.42
Mean	2.66	1.22	0.969	1.11	0.696	1.33	1.25	1.86	0.760	1.25	7.79	9.85
Ac-ft	164	75	58	68	41	81	77	104	47	74	479	586

Calendar year 1964:	Max	72.3	Min	0.46	Mean	2.18	Ac-ft	1,580
Fiscal year 1964-65:	Max	62.0	Min	0.54	Mean	2.56	Ac-ft	1,850

* Discharge measurement made on this day.

Peak discharge (base, 300 cfs, revised)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
2-20	1630	3.57	428	6-15	1630	3.14	302
5-22	1130	3.55	455	6-21	0930	3.17	311

8775. Genka-kawa near Genka

Location.--Lat 26°36'43" N., long 128°03'47" E., on right bank 1.2 miles south of Genka and 2.1 miles southeast of Nakaoshi.

Drainage area.--3.9 sq mi, approximately.

Records available.--November 1963 to June 1965.

Gage.--Water-stage recorder. Altitude of gage is 90 ft (from topographic map).

Extremes.--Maximum discharge during year, 2,510 cfs May 22 (gage height, 8.95 ft), from rating curve extended above 490 cfs on basis of slope-area measurement at gage height 12.9 ft; minimum, 3.18 cfs Feb. 14, 15.

1963-65: Maximum discharge, 3,330 cfs June 16, 1964 (gage height, 9.78 ft), from rating curve extended above 170 cfs; minimum, 2.26 cfs Dec. 1, 1963.

Minimum discharge known, 1.89 cfs Oct. 21, 1963, result of discharge measurement.

Remarks.--Records fair. No diversion above station. Daily sediment samples and continuous records of rainfall are obtained at station.

Discharge, in cubic feet per second, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	14.3	11.4	5.65	5.25	4.90	3.62	4.59	4.45	8.02	6.70	5.08	*22.9
2	13.4	11.0	5.45	4.45	5.85	3.62	4.45	4.28	8.02	6.70	9.44	34.9
3	12.9	11.4	5.45	4.15	4.72	*3.86	29.6	3.62	6.70	12.9	42.5	50.0
4	12.9	10.5	5.45	4.28	4.72	4.45	55.8	3.62	*6.70	14.8	8.68	31.1
5	12.4	9.34	5.25	4.15	21.5	3.50	*12.6	4.28	6.45	12.9	6.70	71.2
6	*11.9	9.01	5.25	*4.15	4.59	3.40	11.0	5.65	8.02	8.68	6.70	92.0
7	11.4	8.68	5.25	4.28	4.15	3.40	10.5	3.86	12.9	*6.70	10.5	49.8
8	11.4	9.34	5.08	*49.4	4.00	14.8	*10.0	3.40	8.35	6.70	8.02	40.0
9	*11.0	9.01	*5.08	21.9	4.00	7.24	8.02	3.40	8.02	6.45	40.6	32.0
10	10.5	8.02	*5.08	8.35	4.15	13.7	7.69	5.65	5.25	15.2	32.5	28.3
11	10.0	*7.36	4.90	6.70	*3.86	8.02	7.03	4.45	5.08	11.0	24.7	25.6
12	9.67	7.03	4.90	6.25	3.62	5.25	*6.70	3.86	4.90	8.02	12.9	30.5
13	9.34	7.36	4.90	10.4	3.50	4.45	6.70	3.40	4.90	*27.2	8.35	33.0
14	9.01	6.45	4.90	*12.0	3.40	4.68	6.25	3.18	4.28	12.9	5.91	26.5
15	9.01	6.45	4.90	*6.70	3.40	*4.28	6.05	3.18	4.28	8.35	14.3	155
16	9.01	7.03	4.90	6.05	3.40	26.7	6.25	3.40	*10.8	*7.69	61.0	64.6
17	11.2	28.0	4.90	5.85	3.40	106	6.05	3.86	4.28	7.36	39.0	44.3
18	8.68	11.0	4.72	5.45	3.40	30.3	6.05	*3.62	3.75	21.7	*33.0	37.0
19	8.02	8.35	4.72	5.25	*3.40	12.9	6.05	3.62	3.75	14.3	34.0	32.0
20	24.6	*7.69	4.59	*5.25	3.40	9.01	5.85	246	3.40	9.67	29.2	72.0
21	9.34	8.02	4.90	5.25	3.40	8.02	4.90	43.2	3.40	*9.01	106	302
22	*8.02	8.02	4.59	5.08	3.40	7.03	4.90	19.8	6.45	8.02	*283	*73.4
23	11.2	7.03	4.59	5.08	3.40	7.36	4.72	19.8	6.45	6.70	164	62.2
24	8.35	6.70	4.59	5.25	3.40	6.70	4.72	14.8	14.8	6.70	*88.5	54.0
25	8.68	6.25	4.45	4.90	3.29	6.05	4.72	11.0	8.02	6.05	53.2	44.3
26	19.6	6.05	4.90	4.72	3.29	6.25	4.59	8.68	6.45	6.05	41.0	40.0
27	219	6.05	5.45	4.72	3.29	6.05	4.59	8.35	4.90	6.70	*33.0	40.3
28	34.0	*5.85	4.72	4.72	3.29	5.85	4.45	8.35	3.75	5.08	27.4	54.7
29	19.1	5.85	11.5	4.72	3.86	4.90	4.45	---------	4.90	8.24	24.7	37.0
30	14.8	5.85	*12.9	4.72	4.38	4.90	5.65	---------	20.2	8.02	22.0	32.0
31	12.9	5.65	---------	4.72	---------	6.05	4.28	---------	8.68	---------	20.6	---------
Total	595.63	265.74	163.91	234.14	132.36	342.34	269.20	454.76	215.85	296.49	1,296.48	1,712.6
Mean	19.2	8.57	5.46	7.55	4.41	11.0	8.68	16.2	6.96	9.88	41.8	57.1
Ac-ft	1,180	527	325	464	263	679	534	902	428	588	2,570	3,400

Calendar year 1964: Max 388 Min 2.78 Mean 13.5 Ac-ft 9,790
Fiscal year 1964-65: Max 302 Min 3.18 Mean 16.4 Ac-ft 11,860

* Discharge measurement made on this day.

Peak discharge (base, 700 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
2-20	1600	7.93	1,900	6-15	1800	6.03	944
5-22	1200	8.95	2,510	6-21	1030	6.76	1,260

8782. Hanechi-okawa at Kawakami

Location.--Lat 26°36'28" N., long 128°01'16" E., on left bank 0.4 mile south of Kawakami, 0.7 mile southeast of Taira School, and 1.0 mile southwest of Nakaoshi.

Drainage area.--4.4 sq mi, approximately.

Records available.--November 1963 to June 1965.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 50 ft (from topographic map). Prior to May 3, 1965, at datum 1.00 ft lower.

Extremes.--Maximum discharge during year, 2,400 cfs Feb. 20 (gage height, 5.00 ft), from rating curve extended above 190 cfs; minimum, 3.08 cfs Nov. 27, 28.

1963-65: Maximum discharge, 7,840 cfs (revised) June 16, 1964 (gage height, 6.03 ft, present datum), from rating curve extended above 190 cfs; minimum, not determined; minimum daily, 1.8 cfs Nov. 30, Dec. 1, 1963.

Minimum discharge known, 0.40 cfs Oct. 21, 1963, result of discharge measurement.

Revisions.--The maximum discharge for the period November 1963 to June 1964 has been revised to 7,840 cfs June 16, 1964 (gage height, 7.03 ft), superseding figure published in Surface Water Records of Hawaii and other Pacific Areas (1964).

Remarks.--Records fair except those for periods of no gage-height record, which are poor. No diversion above station. Records include small diversion from gage pool for irrigation below station. Sediment samples for high flows and continuous records of rainfall are obtained at station.

Revisions.--The revised figure of discharge, in cubic feet per second, for a day in the fiscal year 1964, superseding that published in Surface Water Records of Hawaii and other Pacific Areas (1964), is given herewith:

June 16, 1964..... 856

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
June 1964.....	2,709.5	856	16.8	90.3	5,370

Rating tables (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used July 1-26, Aug. 24 to Oct. 8, Nov. 1 to Dec. 16, Dec. 23 to Jan. 3, Feb. 5-20, Mar. 4 to Apr. 14, Apr. 24-29)

July 1 to May 3				May 4 to June 30			
1.8	2.75	2.4	21.0	1.2	11.5	1.6	70.0
2.0	4.15	2.5	37.0	1.3	16.3	1.9	174
2.1	5.40	2.7	84.0	1.4	28.2	2.2	334
2.2	7.20	3.0	187	1.5	46.5		
2.3	10.5	3.3	349				

Discharge, in cubic feet per second, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	16.8	16.8	5.02	8.19	5.03	3.55	3.92	5.0	8.52	6.66	5.2	223
2	13.6	15.8	*4.78	5.58	*5.50	3.40	3.62	4.5	8.52	6.12	6.0	24.6
3	11.6	24.2	4.65	4.28	4.59	5.10	27.4	4.5	*8.19	8.19	45	37.3
4	9.51	21.0	4.65	4.40	7.83	8.01	87.2	*4.5	7.20	8.52	*15.0	*38.3
5	8.52	15.8	4.65	*3.85	27.4	3.48	242	5.02	6.66	8.52	12.4	64.3
6	8.19	12.6	4.52	3.75	11.6	3.27	18.9	6.60	8.19	6.66	12.4	*78.7
7	7.53	11.6	4.78	3.55	8.85	3.20	18.9	4.40	11.6	*6.12	14.4	52.8
8	7.20	11.6	4.40	68.6	6.48	9.18	17.8	4.15	8.19	6.12	12.4	40.5
9	6.66	10.5	4.40	37.0	6.48	7.21	13.6	4.08	7.20	6.12	60.4	32.9
10	6.66	*10.5	6.86	17.8	5.95	12.6	11.6	*6.35	6.66	11.6	58.0	28.2
11	6.48	10.2	6.18	10.5	4.52	9.84	10.2	4.87	6.12	8.19	55.2	26.7
12	6.30	10.2	4.65	9.51	4.00	11.6	8.52	4.00	5.58	6.66	32.9	32.9
13	*6.30	11.6	4.28	21.1	3.70	5.66	*7.5	3.62	5.58	18.8	26.7	36.5
14	5.94	9.84	4.28	20.0	3.70	3.92	6.6	3.48	5.58	7.14	25.2	28.2
15	5.58	9.51	4.28	10.2	3.62	3.70	6.2	3.34	5.58	6.66	42.5	105
16	6.28	9.51	4.15	*9.51	3.55	*9.72	5.9	3.40	6.12	6.12	88.8	74.7
17	15.6	18.9	4.40	9.0	3.48	79.4	5.6	3.92	5.02	6.66	*46.5	*43.0
18	7.52	*16.8	4.08	8.52	3.48	29.0	5.4	3.48	5.02	11.6	*36.5	36.5
19	5.58	11.6	4.08	8.19	3.40	17.8	5.2	*3.27	5.02	7.20	34.6	32.9
20	14.9	10.2	4.00	8.19	3.34	10.5	5.0	260	5.02	6.93	29.7	97.1
21	8.19	12.6	4.00	9.51	3.34	8.52	4.9	47.0	4.65	6.66	*65.1	285
22	6.66	11.6	4.00	8.19	3.34	8.19	4.9	21.0	6.66	6.66	*219	116
23	7.20	10.2	3.92	7.20	3.27	7.20	4.8	20.0	6.12	6.12	155	*117
24	6.48	8.96	4.00	7.20	3.27	6.66	4.8	17.8	6.66	5.76	*96.7	*80.6
25	6.66	7.53	3.92	6.84	3.20	6.12	4.7	13.6	6.12	5.39	65.0	57.6
26	19.2	6.66	5.02	6.48	3.14	6.66	4.7	11.6	6.12	8.71	48.5	50.6
27	*304	6.30	4.97	6.84	3.14	6.12	4.7	10.2	5.58	10.7	38.5	51.2
28	47.5	5.76	7.52	5.94	3.20	5.02	4.7	10.2	5.02	5.02	29.7	65.0
29	27.4	5.22	*4.46	5.43	4.26	4.65	4.7	---------	5.02	6.77	26.7	44.5
30	21.0	4.90	30.6	5.02	8.24	4.40	6.4	---------	10.2	8.0	25.2	36.5
31	18.9	5.15	---------	4.78	---------	4.28	5.0	---------	7.20	---------	22.3	---------
Total	649.94	353.64	165.50	345.15	164.90	307.96	347.56	493.88	204.92	230.38	1451.5	1837.4
Mean	21.0	11.4	5.52	11.1	5.50	9.93	11.2	17.6	6.61	7.68	46.8	622
Ac-ft	1290	701	328	685	327	611	689	980	406	457	2880	3640

Calendar year 1964: Max 856 Min 1.99 Mean 16.0 Ac-ft 11630
Fiscal year 1964-65: Max 304 Min 3.14 Mean 18.0 Ac-ft 12990

Peak discharge (base, 900 cfs, revised)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
2-20	1700	5.00	2,400	5-22	1200	2.96	988

* Discharge measurement made on this day.

Note.--No gage-height record Oct. 17, Jan. 13 to Feb. 4, Apr. 30 to May 3.

8785. Oi-kawa at Jingusuku

Location.--Lat 26°39'07" N., long 127°57'24"E., on left bank 0.1 mile west of Jingusuku, 0.8 mile west of Gogayama, and 2.5 miles east of Manna.

Drainage area.--3.1 sq mi, approximately.

Records available.--March to June 1965.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 180 ft (from topographic map).

Extremes.--Maximum discharge during year, 1,820 cfs June 15 (gage height, 7.40 ft), from rating curve extended above 160 cfs on basis of slope-area measurements at gage heights 7.40 and 8.50 ft; no flow for many days.
1964-65: Maximum discharge, that of June 15, 1965; no flow at times each year.

Remarks.--Records good except those for period of no gage-height record, which are fair. Sediment samples for high flows and continuous records of rainfall are obtained at station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

0.97	0	1.6	8.90
1.0	.02	1.7	13.1
1.1	.20	1.8	19.5
1.2	.72	2.0	37.5
1.3	1.70	2.2	65.0
1.4	3.30	2.5	126
1.5	5.60	3.0	268

Discharge, in cubic feet per second, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	4.35	6.20	0.96	0.17	0	0	0	0	0.32	0.72	1.05	3.30
2	4.10	5.10	*.66	.05	*0	*0	0	0	.24	.66	1.15	2.92
3	3.90	3.90	.59	0	0	0	1.57	0	*.17	3.43	7.14	4.10
4	3.50	7.68	.59	0	.81	0	18.1	*0	.14	2.70	.94	*7.82
5	3.10	5.35	.47	*0	.01	0	1.70	0	.07	2.10	1.83	11.7
6	2.92	3.50	.37	0	0	0	.96	0	.39	1.45	1.70	25.5
7	2.75	2.92	.53	0	0	.01	.96	0	4.32	*1.15	1.45	11.4
8	2.57	2.25	.47	.01	0	0	.88	0	1.35	.96	1.35	8.10
9	2.25	1.96	.53	.89	0	0	.53	0	.88	.72	8.00	*7.10
10	2.10	*1.66	3.50	.20	0	.01	.32	0	.53	2.47	16.4	6.20
11	1.96	3.10	.7	.11	0	0	.14	0	.37	1.57	16.9	5.35
12	1.83	2.92	.5	.04	0	0	.09	0	.28	1.25	5.35	9.73
13	*1.83	2.92	.4	.04	*0	0	*.05	0	.17	4.28	4.85	10.2
14	1.57	2.57	.3	.09	0	0	.02	0	.09	2.92	4.38	7.10
15	1.45	2.40	.3	.05	0	0	0	0	.07	1.96	10.8	*137
16	1.45	2.68	.2	.01	0	*0	0	0	.30	1.57	6.88	*27.4
17	1.45	5.10	.1	0	0	9.30	0	0	.09	1.25	*6.80	13.1
18	1.35	3.90	.1	0	0	2.68	0	*0	.05	4.55	*5.90	9.74
19	1.25	2.92	.1	0	0	.42	0	0	.02	3.30	8.10	7.40
20	6.23	2.40	0	0	0	.04	0	64.6	0	2.10	6.50	7.70
21	5.35	2.40	0	0	0	0	0	8.39	0	1.57	34.1	*60.7
22	4.85	2.40	0	0	0	0	0	2.07	0	1.45	69.7	20.3
23	5.10	2.10	0	0	0	0	0	3.00	0	1.25	115	11.8
24	4.10	1.70	0	0	0	0	0	2.57	.68	1.05	36.0	9.39
25	3.90	1.45	0	0	0	0	0	1.35	.42	.88	16.3	8.90
26	11.9	1.15	.1	0	0	0	0	.96	.32	.72	11.4	8.10
27	161	.96	.2	0	0	0	0	.59	.20	.66	8.50	10.5
28	26.0	.80	.6	0	0	0	0	.42	.11	.59	6.80	13.8
29	12.7	.53	*.28	0	0	0	0	---------	.18	2.62	5.35	*8.27
30	10.2	.47	.28	0	0	0	0	---------	2.25	1.57	4.60	7.40
31	8.10	.42	---------	0	---------	0	0	---------	1.05	---------	3.70	---------
Total	305.11	85.81	12.83	1.66	0.82	12.46	25.32	83.95	15.06	53.47	428.92	482.02
Mean	9.84	2.77	0.428	0.054	0.027	0.402	0.817	3.00	0.486	1.78	13.8	16.1
Ac-ft	605	170	25	3.3	1.6	25	50	167	30	106	851	956

Calendar year 1964: Max - Min - Mean - Ac-ft -
Fiscal year 1964-65: Max 161 Min 0 Mean 4.13 Ac-ft 2,990

Peak discharge (base, 450 cfs, revised)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
2-20	1600	3.86	594	6-15	1630	7.40	1,820
5-23	1530	4.85	990				

* Discharge measurement or observation of no flow made on this day.

Note.--No gage-height record Sept. 11-28.

8809. Machinato-gawa near Ojana

Location.--Lat 26°14'43" N., long 127°44'16" E., on right bank on upstream side of bridge on dirt road, 1.4 miles south of Ojana, and 2.4 miles northeast of Shuri.

Drainage area.--1.7 sq mi, approximately.

Records available.--April to June 1965.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 180 ft (from topographic map).

Extremes.--Maximum discharge during period, 812 cfs June 15 (gage height, 7.78 ft), from rating curve extended above 370 cfs by logarithmic plotting; minimum, 0.50 cfs Apr. 28, 29.

Remarks.--Records good. Sediment samples for high flows and continuous records of rainfall are obtained at station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

0.7	0.37	1.3	16.2
.8	1.00	1.5	30.0
.9	2.26	2.0	68.5
1.0	4.25	3.0	152
1.1	7.10	5.0	380
1.2	11.0		

Discharge, in cubic feet per second, April to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1										11.1	2.11	1.36
2										3.10	2.23	21.2
3										1.96	*28.8	*21.4
4										1.82	5.90	5.60
5										1.69	3.16	17.0
6										*1.39	18.3	*270
7										1.21	52.8	16.6
8										*1.00	8.90	6.8
9										.92	19.3	4.02
10										2.24	*81.2	2.60
11										1.96	38.5	1.69
12										1.32	7.80	12.9
13										*18.1	5.90	43.4
14										*7.71	4.05	11.0
15										3.58	57.2	111
16										*2.11	83.5	32.2
17										1.69	*24.0	7.80
18										11.8	86.7	4.25
19										30.5	34.3	3.58
20										4.50	8.50	7.10
21										2.78	5.02	32.7
22										1.82	16.2	13.6
23										1.56	59.6	5.90
24										1.32	27.7	*3.58
25										1.00	7.98	2.60
26										.75	4.76	2.11
27										.68	2.78	6.64
28										.55	1.96	40.3
29								---------		2.22	1.32	6.80
30			---------		---------			---------		4.76	1.00	3.36
31								---------		---------	.75	---------
Total										127.14	702.22	719.09
Mean										4.24	22.7	24.0
Ac-ft										252	1390	1430

Calendar year	Max		Min		Mean		Ac-ft	
Fiscal year 1964-65:	Max	-	Min	-	Mean	-	Ac-ft	-

* Discharge measurement made on this day.

Peak discharge (base, 450 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
5-10	1400	5.59	463	6-15	1900	7.78	812
6-6	0500	7.30	728				

8828. Kanna-gawa near Kanna

Location.--Lat 26°29'20" N., long 127°56'46" E., on left bank 1.6 miles northwest of Kanna-shogakko (elementary school), 1.7 miles upstream from bridge at mouth, and 2.6 miles northeast of Kin.

Drainage area.--0.9 sq mi, approximately.

Records available.--June 1963 to June 1965.

Gage.--Water-stage recorder and combination of sharp-crested weir and concrete control. Altitude of gage is 70 ft (from topographic map). Prior to Nov. 14, 1963, at datum 0.40 ft higher.

Extremes.--Maximum discharge during year, 714 cfs May 22 (gage height, 5.36 ft), from rating curve extended above 23 cfs as explained below; minimum, 0.55 cfs Mar. 20.

1963-65: Maximum discharge, 810 cfs June 16, 1964 (gage height, 5.60 ft, from floodmark), from rating curve extended above 23 cfs on basis of theoretical rating for the artificial control; minimum, 0.12 cfs July 24, 26, 27, 1963.

Remarks.--Records good except those for periods of doubtful or no gage-height record and those above 50 cfs, which are fair. No diversion above station. Continuous records of rainfall are obtained at station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Backwater from debris May 12-15)

0.9	0.48	1.8	6.40
1.0	.74	2.0	17.0
1.1	1.08	2.5	51.0
1.3	1.96	3.0	106
1.7	4.70		

Discharge, in cubic feet per second, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.34	3.14	1.40	1.3	0.97	0.80	0.77	0.77	0.80	1.08	1.00	3.0
2	3.07	2.88	1.36	1.1	1.06	.71	.72	.71	.80	1.0	1.53	4.5
3	2.94	2.99	1.32	1.0	.86	.90	6.99	.66	.77	1.4	6.75	4.0
4	2.81	2.74	1.27	1.3	1.40	.86	11.9	.66	.71	1.08	1.23	35
5	2.74	2.55	1.27	1.4	3.24	.74	1.69	.68	.68	.93	1.00	14
6	2.62	2.43	1.23	2.5	1.08	.71	1.44	.74	.92	.83	1.32	25
7	2.49	2.31	1.23	1.5	.93	.68	1.55	.68	1.50	.77	1.99	9.0
8	2.37	2.47	1.18	4.0	.89	2.63	1.4	.68	.93	.74	5.36	7.0
9	2.31	2.31	1.14	2.5	.89	2.69	1.3	.68	.80	.74	8.48	6.0
10	2.20	2.14	4.54	1.5	.86	1.77	1.2	1.09	.71	1.68	10.4	5.0
11	2.14	2.02	1.60	1.08	.80	1.04	1.1	.83	.68	.94	7.25	4.5
12	2.08	2.14	1.36	1.08	.77	.89	1.0	.74	.68	.77	2.51	10
13	2.02	2.49	1.32	5.91	.71	.77	.94	.68	.68	3.51	1.81	15.2
14	1.96	2.18	1.23	2.70	.71	.74	.90	.68	.66	1.69	1.71	4.70
15	2.02	1.86	1.4	1.52	.71	.74	.88	.66	.66	1.18	9.47	34.7
16	2.56	1.88	1.2	1.40	.71	4.07	.87	.71	.85	1.08	16.8	8.64
17	2.73	3.56	1.1	1.59	.71	14.1	.86	.94	.60	1.04	4.62	5.55
18	1.91	2.18	1.0	1.08	.71	2.71	.86	.77	.60	3.49	4.18	4.87
19	1.81	2.41	1.08	1.04	.71	1.27	.86	.68	.63	2.32	5.37	*4.54
20	10.2	1.96	1.04	1.04	.68	1.11	.83	7.58	*.60	1.40	3.55	13.2
21	2.45	2.46	1.14	2.83	.68	1.00	.80	2.04	.60	1.18	4.23	58.5
22	2.22	2.1	1.08	1.36	.68	.93	.80	1.04	3.22	1.08	77.9	11.2
23	2.68	1.9	1.0	1.18	.66	.89	*.80	1.04	2.06	1.04	30	7.42
24	1.96	1.7	1.0	1.24	.66	.86	.77	.89	1.43	*1.04	15	6.40
25	1.96	1.6	1.5	1.04	.66	.83	.74	.80	1.08	1.00	9.0	5.89
26	16.9	1.56	*1.3	.96	.63	.87	.74	.77	1.08	1.00	5.55	*5.72
27	88.3	1.52	1.1	.96	.63	.83	.77	.89	.86	1.04	4.42	8.27
28	6.74	1.48	1.0	.89	.63	.80	.74	1.01	.80	1.00	3.90	10.3
29	4.38	1.44	1.2	.86	1.37	.77	.74	---------	1.24	2.11	3.34	5.55
30	3.76	1.40	2.0	.83	1.17	.74	.77	---------	1.82	1.78	2.88	5.21
31	3.34	1.40	---------	.80	---------	1.02	.71	---------	1.52	---------	2.74	---------
Total	191.01	67.20	40.59	49.49	27.17	49.47	46.44	30.10	30.97	39.94	255.29	342.86
Mean	6.16	2.17	1.35	1.60	0.906	1.60	1.50	1.08	1.00	1.33	8.24	11.4
Ac-ft	379	133	81	98	54	98	92	60	61	79	506	680

Calendar year 1964:	Max	88.3	Min	0.32	Mean	2.77	Ac-ft	2.010
Fiscal year 1964-65:	Max	88.3	Min	0.60	Mean	3.21	Ac-ft	2.320

Peak discharge (base, 180 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
7-27	0100	4.82	517	6-15	1700	4.93	556
5-22	1100	5.36	714	6-21	1200	5.08	608

* Discharge measurement made on this day.

Note.--Doubtful or no gage-height record Aug. 22-25, Sept. 15-18, Sept. 23 to Oct. 10, Jan. 8-16, Apr. 2, 3, May 23-25, June 1-12.

8830. Ufu-kawa near Ginoza

Location.--Lat 26°29'36" N., long 127°58'08" E., on left bank 1.1 miles northwest of Ginoza and 1.4 miles northeast of Kanna.

Drainage area.--1.3 sq mi, approximately.

Records available.--June 1963 to June 1965.

Gage.--Water-stage recorder and combination of sharp-crested weir and concrete control. Altitude of gage is 120 ft (from topographic map). Prior to Nov. 14, 1963, at datum 0.50 ft higher.

Extremes.--Maximum discharge during year, 561 cfs June 21 (gage height, 6.16 ft), from rating curve extended above 25 cfs on basis of theoretical rating for the artificial control; minimum, 0.58 cfs Oct. 31.
1963-65: Maximum discharge, that of June 21, 1965; minimum, 0.05 cfs July 29, 1963.

Remarks.--Records good except those for periods of doubtful or no gage-height record and those above 50 cfs, which are fair. Some regulation by two reservoirs above station. Diversion from reservoirs for irrigation of 262 acres of rice fields below station. Small diversion from reservoir on Left Fork for domestic use in Ginoza.

Rating tables (gage height, in feet, and discharge, in cubic feet per second)

July 1-17		July 18 to June 30			
1.0	0.46	0.6	0.59	1.8	7.75
1.2	1.05	.7	.69	2.1	13.0
1.4	1.95	.9	1.02	2.2	17.1
		1.1	1.58	2.5	35.9
		1.3	2.57	3.0	82.0
		1.5	4.20		

Discharge, in cubic feet per second, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.24	1.30	0.85	1.78	0.66	0.87	0.80	0.78	0.91	0.83	0.68	3.29
2	1.15	1.20	.83	1.14	.73	.82	.75	.76	.91	.84	1.08	4.48
3	1.12	1.25	.87	.96	.63	.83	8.0	.76	.89	.99	5.60	4.09
4	1.05	1.12	.83	1.07	1.60	.82	10	.78	.85	.85	1.06	30.1
5	.98	1.00	.83	1.03	3.87	*.80	2.5	.80	.82	.78	.85	15.8
6	.94	.96	.82	1.24	.85	.78	1.5	*.80	*.92	.74	1.28	24.1
7	.87	.91	.83	.95	*.76	.78	1.7	.78	1.68	.70	1.54	10.6
8	.84	1.23	.83	1.99	.74	2.54	1.5	.78	1.17	.70	1.74	7.36
9	.78	.94	.82	1.46	.72	2.54	1.3	.76	1.04	.70	9.18	6.09
10	.75	.87	1.54	*.84	.70	1.52	1.2	1.04	.98	*1.5	9.88	5.49
11	.72	.85	.94	.76	.72	.91	1.1	.82	.96	.76	6.76	4.94
12	.69	.87	.94	.76	.94	*.85	1.0	.75	.96	.70	2.83	7.03
13	.69	1.14	1.00	2.18	.96	.76	.92	*.75	.91	3.68	2.23	16.1
14	.66	.84	.92	1.53	*.94	.74	.86	.76	.89	1.29	2.22	7.42
15	.66	.85	1.2	.96	.94	.74	.82	.75	.88	.89	7.33	55.5
16	1.03	.94	1.1	1.20	.91	6.79	*.80	.77	.94	.87	14.3	14.4
17	1.77	2.18	1.0	*1.99	.94	11.6	.80	.85	.87	.87	4.62	7.64
18	.81	1.23	.90	1.58	.94	2.11	.80	.83	.85	3.60	4.49	6.33
19	.76	1.10	1.00	1.30	.96	*1.18	.78	.96	.83	2.06	5.38	5.50
20	6.03	.92	.89	1.27	.92	1.04	.74	*10.3	*.82	.98	3.51	17.5
21	.97	1.22	.89	2.24	*.94	.98	.73	1.91	.75	.83	5.08	76.3
22	.76	1.1	.87	.91	.92	.92	.72	1.10	2.42	.76	70	13.8
23	1.18	1.0	.87	.83	.91	.91	*.72	1.02	1.46	.73	20	7.90
24	.76	.94	.89	*.86	.87	.87	.72	.94	1.00	*.70	10	6.71
25	.75	.90	1.12	.75	.87	.85	.72	.91	.82	.68	6.0	5.85
26	9.53	.87	1.05	.73	.87	*.87	.73	.91	.82	.67	4.52	*5.37
27	70	.87	1.00	.73	.87	.83	.83	*1.02	.75	.64	3.75	7.00
28	6.0	.85	.92	.69	*.87	.82	.80	1.00	.72	.63	3.48	11.5
29	2.5	.85	1.00	.66	1.23	.80	.80	---------	.80	1.50	3.30	5.97
30	1.8	.83	1.58	.63	1.01	.80	.80	---------	1.73	.94	3.15	5.04
31	1.5	.83	---------	*.62	---------	*.90	.75	---------	1.11	---------	3.08	---------
Total	119.29	31.96	29.13	35.64	29.79	48.57	46.19	34.39	31.46	32.41	218.92	399.20
Mean	3.85	1.03	0.971	1.15	0.993	1.57	1.49	1.23	1.01	1.08	7.06	13.3
Ac-ft	237	63	58	71	59	96	92	68	62	64	434	792

Calendar year 1964:	Max	70	Min	0.18	Mean	2.64	Ac-ft	1,920
Fiscal year 1964-65:	Max	76.3	Min	0.62	Mean	2.90	Ac-ft	2,100

* Discharge measurement made on this day.
Note.--Doubtful or no gage-height record July 27-31, Aug. 22-25, Sept. 15-18, 26, Jan. 3-16, Apr. 10, May 22-25.

8833. Left Fork O-kawa near Kushi

Location.--Lat 26°31'18" N., long 127°59'50" E., on left bank 1.1 miles northwest of Kushi and 1.1 miles north of Katabaru.

Drainage area.--0.3 sq mi, approximately.

Records available.--June 1963 to June 1965.

Gage.--Water-stage recorder and combination of sharp-crested weir and concrete control. Altitude of gage is 60 ft (from topographic map). Prior to Nov. 20, 1963, at datum 0.40 ft higher.

Extremes.--Maximum discharge during year, 146 cfs June 21 (gage height, 3.60 ft), from rating curve extended above 11 cfs as explained below; minimum, 0.13 cfs Nov. 28, Mar. 20, 21.

1963-65: Maximum discharge, 179 cfs June 16, 1964 (gage height, 3.82 ft), from rating curve extended above 11 cfs on basis of theoretical rating for the artificial control; minimum, 0.05 cfs July 17-27, 29, 1963.

Remarks.--Records good except those for periods of doubtful or no gage-height record and those above 30 cfs, which are fair. No diversion above station. Continuous records of rainfall are obtained at station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

0.7	0.13	1.4	2.55
.8	.27	1.7	4.80
.9	.46	2.0	8.40
1.0	.73	2.1	11.4
1.2	1.45	2.3	21.0

Discharge, in cubic feet per second, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.85	0.75	0.32	0.27	0.21	0.17	0.18	0.18	0.21	0.24	0.22	1.0
2	.78	.70	.30	.23	.28	.15	.24	.16	.22	.24	.42	1.3
3	.75	1.06	.32	.22	.21	.17	3.56	.15	.21	.32	1.79	1.2
4	.73	.79	.30	.31	1.93	.17	1.88	.15	.19	.30	.34	8.0
5	.70	.61	.28	.28	1.57	.17	.42	.16	.18	.27	.27	4.5
6	.64	.59	.28	.60	.30	.17	.39	.18	*.24	.21	.38	7.0
7	.61	.56	.32	.30	.25	.15	.43	.15	.37	.18	.54	3.5
8	.59	.60	.28	1.05	.23	.80	.35	.15	.22	.17	.54	2.1
9	.56	.54	.27	.57	.25	.69	.30	.15	.19	.18	2.82	1.8
10	.54	.49	.69	.27	.23	.40	.27	.26	.18	*.49	3.14	1.6
11	.51	.49	.38	.23	.21	.25	.25	.19	.17	.22	2.22	1.5
12	.49	.46	.34	.23	.19	.22	.23	.17	.17	.18	.95	2.0
13	.49	.49	.36	1.39	.19	.19	.22	.17	.17	1.20	.70	2.80
14	.46	.44	.36	.95	.18	.18	.21	.15	.15	.36	.66	1.50
15	.44	.42	.40	.32	.18	.18	.20	.15	.17	.23	1.76	8.00
16	.64	.49	.35	.28	.18	1.61	.20	.17	.20	.19	4.42	3.33
17	.75	1.19	.31	.36	.17	3.86	.19	.22	.15	.21	1.77	2.07
18	.46	.55	.30	.25	.17	.69	.21	.17	.15	1.31	1.49	1.75
19	.42	.55	.33	.23	.18	.34	.21	.15	.15	.66	1.78	1.55
20	2.45	.46	.25	.23	.17	.27	.19	*2.5	*.14	.36	1.21	6.25
21	.56	.56	.27	.38	.17	.23	.19	.80	.14	.28	3.04	20.2
22	.49	.50	.25	.23	.17	.23	.18	.32	.48	.23	*13.2	3.96
23	.42	.45	.23	.23	.17	.22	*.18	.30	.31	.23	9.50	2.61
24	.40	.40	.23	.25	.15	.21	.18	.23	.32	*.22	4.13	2.19
25	.46	.37	.34	.22	.15	.21	.18	.21	.22	.22	2.16	1.85
26	3.00	.36	*.30	.21	.15	.22	.18	.21	.22	.23	1.65	*1.65
27	15.6	.38	.27	.21	.15	.21	.18	.24	.18	.23	1.29	1.94
28	1.67	.36	.23	.21	.15	.21	.17	.25	.17	.19	1.09	3.18
29	1.09	.32	.27	.19	.32	.19	.17	---------	.20	.49	1.0	1.80
30	.88	.32	.51	.19	.26	.19	.18	---------	.44	.41	.94	1.55
31	.78	.32	---------	.18	---------	.23	.17	---------	.31	---------	.90	---------
Total	39.21	16.57	9.64	11.07	9.12	13.18	12.09	8.29	6.82	10.25	66.32	103.68
Mean	1.26	0.535	0.321	0.357	0.304	0.425	0.390	0.296	0.220	0.342	2.14	3.46
Ac-ft	78	33	19	22	18	26	24	16	14	20	132	206

Calendar year 1964: Max 19.1 Min 0.06 Mean 0.690 Ac-ft 502
Fiscal year 1964-65: Max 20.2 Min 0.14 Mean 0.839 Ac-ft 608

Peak discharge (base, 60 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
5-22	1000	3.12	88.2	6-15	1600	3.12	88.2
5-23	1600	3.05	81.0	6-21	1030	3.60	146

* Discharge measurement made on this day.

Note.--Doubtful or no gage-height record Aug. 22-25, Sept. 15-18, Jan. 8-16, Jan. 27 to Feb. 6, Feb. 20, May 29 to June 12.

8841. Fukuji-gawa near Yubaru

Location.--Lat 26°38'32" N., long 128°13'00" E., on left bank 1.1 miles north of Yubaru and 2.4 miles northeast of Miyaji.

Drainage area.--5.8 sq mi, approximately.

Records available.--January 1964 to June 1965.

Gage.--Water-stage recorder. Altitude of gage is 130 ft (from topographic map).

Extremes.--Maximum discharge during year, 5,540 cfs June 21 (gage height, 10.90 ft), from rating curve extended above 590 cfs on basis of slope-area measurement of peak flow; minimum, 4.65 cfs Nov. 25-28, Mar. 28, 29.
1964-65: Maximum discharge, that of June 21, 1965; minimum, 3.41 cfs Apr. 19-21, 25, May 3-5, 1964.
Revisions.--The maximum discharge for the period January to June 1964 has been revised to 4,850 cfs June 16, 1964 (gage height, 10.00 ft), superseding figure published in Surface Water Records of Hawaii and other Pacific Areas (1964).

Remarks.--Records good. No diversion above station. Sediment samples for high flows and continuous records of rainfall are obtained at station.

Revisions.--Revised figures of discharge, in cubic feet per second, for high-water periods in the fiscal year 1964, superseding those published in Surface Water Records of Hawaii and other Pacific Areas (1964), are given herewith:

1964
May 30.....458
June 15.....487
16.....460

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
May 1964.....	1,347.43	458	3.41	43.5	2,670
June.....	2,897.9	487	18.5	96.6	5,750

Revised peak discharge.--1964: Jan. 28 (0900) 1,550 cfs (5.00 ft); May 30 (1430) 2,640 cfs (6.70 ft); June 16 (1630) 4,850 cfs (10.00 ft).

Rating tables (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 22 to June 21)

July 1 to Aug. 17				Aug. 18 to June 30			
0.8	5.35	1.6	63.0	0.72	4.65	2.0	127
.9	8.95	2.0	125	.9	12.4	2.5	247
1.1	18.5	2.5	255	1.2	31.5	3.0	400
1.3	33.0	3.0	440	1.6	68.5	4.0	830

Discharge, in cubic feet per second, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	17.5	8.95	11.5	11.0	6.10	5.72	6.90	5.72	6.10	7.30	9.11	25.7
2	16.5	8.54	11.0	8.17	6.50	5.35	*6.50	5.72	7.30	7.30	14.0	*76.2
3	15.5	109	10.5	7.30	*6.10	5.35	120	5.35	6.10	30.8	106	121
4	15.0	51.8	10.5	7.70	7.41	6.50	166	5.35	6.10	51.0	15.8	32.8
5	14.0	13.5	10.0	6.90	36.8	5.35	18.0	5.35	5.72	18.8	11.9	114
6	13.0	10.6	9.58	7.30	7.70	5.00	14.1	6.10	6.90	*11.0	11.9	193
7	12.5	9.75	9.58	7.70	6.90	5.00	14.1	5.72	19.6	9.11	23.8	53.0
8	*12.5	9.35	9.11	27.1	6.90	10.0	15.2	5.35	8.64	8.17	15.2	37.7
9	12.0	8.54	8.64	20.0	6.50	10.5	11.0	5.00	6.90	7.70	55.4	30.8
10	11.5	8.16	23.9	8.64	*6.10	24.0	10.0	6.90	5.72	14.9	125	28.6
11	11.0	8.54	*12.1	7.30	6.10	37.6	9.11	*6.10	5.35	10.5	*67.8	*29.1
12	10.6	*8.54	9.11	6.90	5.72	10.0	9.11	5.35	*5.35	7.70	29.3	42.8
13	10.6	10.2	8.64	*88.5	5.72	6.90	8.64	5.00	5.35	56.3	24.3	40.9
14	10.2	8.16	7.70	50.0	5.35	6.10	8.17	5.00	5.35	18.2	23.0	28.6
15	*10.2	7.78	7.30	14.6	5.35	5.72	*7.70	5.00	5.00	*10.5	44.9	202
16	9.75	8.16	*7.30	12.4	5.35	128	7.70	5.00	6.90	9.11	181	63.5
17	9.75	260	7.70	10.0	5.35	223	7.30	5.00	5.35	8.64	41.9	35.4
18	8.95	*31.4	7.30	9.11	5.35	31.8	7.30	5.00	5.00	56.1	33.1	29.3
19	8.54	15.2	7.30	*8.64	5.72	13.5	7.30	5.00	5.00	29.8	46.0	27.9
20	26.8	13.0	6.90	8.64	5.35	10.0	6.90	266	5.00	12.4	37.5	37.0
21	10.6	132	6.90	8.17	5.00	9.11	6.90	30.6	5.00	11.0	286	*601
22	8.54	73.3	6.90	7.70	5.00	8.17	6.90	*11.5	8.88	10.0	*378	67.2
23	13.6	115	6.90	7.70	5.00	*7.70	6.50	9.11	9.11	9.11	227	*300
24	9.35	26.5	6.90	8.17	5.00	7.30	6.50	8.17	7.70	9.11	82.4	75.9
25	11.4	19.9	6.50	7.70	4.65	6.90	*6.10	6.90	6.90	9.11	47.1	48.8
26	10.7	16.3	8.17	6.90	4.65	10.1	6.10	6.50	6.10	9.11	53.3	41.5
27	239	15.2	18.0	6.90	*4.65	13.5	6.10	6.90	5.35	10.0	40.2	46.2
28	19.2	13.5	*8.44	6.90	4.65	8.64	6.10	7.30	4.65	7.70	*33.8	224
29	12.0	13.0	101	6.50	6.08	*6.90	6.10	---------	5.35	16.2	29.3	46.8
30	10.2	12.4	29.3	6.30	9.11	6.50	6.50	---------	20.7	19.4	27.2	38.1
31	10.2	11.9	---------	6.10	---------	7.70	5.72	---------	8.64	---------	25.0	---------
Total	611.18	1058.17	394.67	406.94	206.16	647.91	530.55	455.99	221.11	496.07	2146.21	2738.8
Mean	19.7	34.1	13.2	13.1	6.87	20.9	17.1	16.3	7.13	16.5	69.2	91.3
Ac-ft	1210	2100	783	807	409	1290	1050	904	439	984	4260	5430

Calendar year 1964: Max - Min - Mean - Ac-ft -
Fiscal year 1964-65: Max 601 Min 4.65 Mean 27.2 Ac-ft 19670

* Discharge measurement made on this day.

Peak discharge (base, 1,800 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
5-22	1230	7.16	2,800	6-23	1830	8.30	3,600
6-21	1100	10.90	5,540				

8842. Fukuji-gawa at Fukuji

Location.--Lat 26°38'16" N., long 128°10'13" E., on left bank at Fukuji, 0.9 mile north of Kawata, and 1.3 miles northeast of Taira.

Drainage area.--12 sq mi, approximately.

Records available.--January 1964 to June 1965.

Gage.--Water-stage recorder. Altitude of gage is 10 ft (from topographic map).

Extremes.--Maximum discharge during year, 8,190 cfs June 21 (gage height, 10.48 ft), from rating curve extended above 1,100 cfs on basis of slope-area measurements at gage heights 8.37, 10.48, and 15.97 ft; minimum, 8.30 cfs Nov. 26-28.

1964-65: Maximum discharge, 9,300 cfs (revised) June 16, 1964 (gage height, 9.55 ft), from rating curve extended above 1,900 cfs; minimum, 6.00 cfs Apr. 23-25, 1964.

Minimum discharge known, 2.57 cfs Oct. 22, 1963, result of discharge measurement.

Revisions.--The maximum discharge for the period Jan. 28 to June 30, 1964, has been revised to 9,300 cfs June 16, 1964 (gage height, 9.55 ft), superseding figure published in Surface Water Records of Hawaii and other Pacific Areas (1964).

Remarks.--Records good. No diversion above station. Daily sediment samples are obtained at station.

Revisions.--Revised figures of discharge, in cubic feet per second, for high-water periods in the period Jan. 28 to June 30, 1964, superseding those published in Surface Water Records of Hawaii and other Pacific Areas (1964), are given herewith:

June 16, 1964..... 1,220

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
June 1964.....	6,251.1	1,220	53.1	208	12,400

Revised peak discharge.--1964: May 30 (1600) 4,130 cfs (6.62 ft); June 16 (1700) 9,300 cfs (9.55 ft).

Rating tables (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 24 to June 1, June 22-30)

July 1 to Feb. 20, June 2-30

1.36	8.30	2.5	223
1.5	15.8	3.0	428
1.6	23.3	4.0	990
1.8	46.5	5.0	1,720
2.1	104		

Feb. 21 to June 1

1.4	10.4	2.0	97.0
1.5	17.2	2.5	248
1.6	26.8	3.0	450
1.7	39.3	4.0	990

Discharge, in cubic feet per second, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	42.1	20.0	25.0	18.1	12.2	9.70	11.7	10.6	14.0	15.5	22.5	67.2
2	40.3	20.0	22.5	15.2	11.7	9.20	10.6	*10.6	15.5	14.8	32.2	134
3	39.5	221	21.6	13.4	*11.2	9.70	93.7	10.2	14.0	42.0	184	279
4	35.8	110	20.8	14.5	11.7	12.2	*212	10.2	13.3	74.3	36.5	93.0
5	34.6	37.0	20.0	13.4	51.5	9.20	30.3	10.6	12.1	*37.3	28.0	210
6	33.5	30.0	18.5	13.9	13.9	8.80	23.3	11.7	15.0	*22.5	27.8	298
7	31.2	27.4	18.5	19.3	11.7	8.80	22.5	10.6	33.1	17.9	43.9	*138
8	31.2	25.0	17.8	74.3	11.2	13.4	23.3	9.70	18.8	17.2	32.5	99.6
9	30.0	23.3	17.1	46.0	11.2	16.1	18.5	9.70	16.3	16.3	92.9	82.0
10	29.0	22.5	33.3	19.3	*10.6	26.8	17.1	12.2	14.0	26.9	215	72.4
11	29.0	21.6	*24.3	15.8	10.2	52.1	15.8	12.2	*12.7	22.5	*132	68.6
12	27.0	*22.5	17.8	15.2	9.70	16.4	15.2	*9.70	12.7	17.2	67.2	90.6
13	26.0	25.0	17.1	*102	9.20	11.2	14.5	9.20	12.7	79.7	53.8	94.4
14	25.0	21.6	15.8	64.8	9.20	10.2	13.9	9.20	12.1	*38.6	48.5	64.7
15	*24.1	20.8	15.8	23.3	9.20	9.20	*12.8	9.20	11.5	22.5	85.3	363
16	24.1	21.0	*15.2	25.0	9.20	101	12.8	*9.20	14.0	19.8	345	237
17	24.1	371	15.2	18.5	9.20	*326	12.8	10.5	11.5	17.9	102	93.0
18	23.3	73.8	14.5	17.1	9.20	60.6	12.2	*10.2	10.9	72.5	77.2	76.2
19	21.6	34.6	14.5	*15.8	9.70	23.3	12.2	9.70	10.9	52.1	94.8	68.6
20	44.0	29.0	13.4	15.2	9.20	17.8	12.2	471	10.4	28.0	*75.9	88.3
21	25.0	187	13.4	14.5	9.20	15.2	*11.7	73.5	10.4	24.5	583	*1,290
22	21.6	97.8	12.8	14.5	9.20	13.9	11.2	26.8	14.7	21.6	*911	*176
23	26.5	208	12.8	14.5	9.20	13.9	11.2	21.6	18.8	*21.6	566	*718
24	22.5	61.2	12.8	14.5	9.20	12.2	11.2	19.8	15.5	20.7	272	198
25	24.1	45.0	12.2	13.9	8.80	11.7	11.2	16.3	15.5	19.8	133	127
26	23.7	37.0	15.8	12.8	8.80	13.9	11.2	*14.8	13.3	20.7	*132	109
27	*337	32.2	24.7	12.8	*8.30	22.5	10.6	15.5	12.1	22.5	102	108
28	42.1	30.0	*16.4	12.8	8.30	14.5	10.6	16.3	10.9	17.9	77.2	298
29	26.0	27.0	117	12.2	9.70	12.2	11.2	---------	10.9	32.3	69.2	*103
30	22.5	26.0	42.6	12.2	15.2	11.7	11.7	---------	32.6	37.8	59.4	84.2
31	21.6	24.1	---------	12.2	---------	13.9	10.6	---------	17.9	---------	53.8	---------
Total	1,208.0	1,952.4	659.2	707.0	346.80	907.30	719.8	870.80	458.1	894.9	4,755.6	5,928.8
Mean	39.0	63.0	22.0	22.8	11.6	29.3	23.2	31.1	14.8	29.8	153	198
Ac-ft	2,400	3,870	1,310	1,400	688	1,800	1,430	1,730	909	1,780	9,430	11,760

Calendar year 1964: Max - Min - Mean - Ac-ft -
Fiscal year 1964-65: Max 1,290 Min 8.30 Mean 53.2 Ac-ft 38,510

* Discharge measurement made on this day.

Peak discharge (base, 3,000 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
5-22	1330	8.37	5,240	6-23	1930	8.62	5,570
6-21	1200	10.48	8,190				

8846. Aha-gawa at Aha

Location.--Lat 26°42'41" N., long 128°16'55" E., on right bank 0.3 mile southwest of Aha School and 1.4 miles upstream from mouth.

Drainage area.--9.5 sq mi, approximately.

Records available.--December 1963 to June 1965.

Gage.--Water-stage recorder. Altitude of gage is 10 ft (from topographic map).

Extremes.--Maximum discharge during year, 8,430 cfs June 23 (gage height, 9.35 ft), from rating curve extended above 300 cfs as explained below; minimum, 6.80 cfs Nov. 25-28.

1963-65: Maximum discharge, 12,700 cfs (revised) June 16, 1964 (gage height, 11.60 ft), from rating curve extended above 300 cfs on basis of slope-area measurements at gage heights 9.35 and 10.5 ft; minimum, that of Nov. 25-28, 1964.

Minimum discharge known, 5.08 cfs Oct. 22, 1963, result of discharge measurement.

Revisions.--The maximum discharge for the fiscal year 1964 has been revised to 12,700 cfs June 16, 1964 (gage height, 11.60 ft), superseding figure published in Surface Water Records of Hawaii and other Pacific Areas (1964).

Remarks.--Records good except those for periods of no gage-height record, which are fair. Sediment samples for high flows and continuous records of rainfall are obtained at station.

Revisions.--The revised figure of discharge, in cubic feet per second, for a day in the fiscal year 1964, superseding that published in Surface Water Records of Hawaii and other Pacific Areas (1964), is given herewith:

June 16, 1964..... 1,080

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
June 1964.....	5,781.9	1,080	42.8	193	11,470

Revised peak discharge.--1964: Jan. 28 (0700) 3,480 cfs (6.05 ft); Feb. 24 (0500) 4,840 cfs (7.10 ft); May 9 (0900) 4,520 cfs (6.87 ft); June 16 (1530) 12,700 cfs (11.60 ft).

Rating table (gage height, in feet, and discharge, in cubic feet per second)

0.64	6.80	2.0	290
.7	11.3	2.5	495
.9	31.3	3.0	760
1.1	59.0	4.0	1,440
1.5	137		

Discharge, in cubic feet per second, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	*37.5	19.5	24.6	36.6	9.80	11.3	18.5	13.0	12.2	14.7	23.5	51.6
2	36.2	18.5	22.5	27.9	11.3	10.5	17.5	11.3	16.5	14.7	136	89.2
3	33.8	49.3	21.5	18.5	11.3	11.3	209	10.5	12.2	78.6	283	262
4	31.3	75.3	20.5	18.5	14.4	16.5	211	9.80	11.3	143	47.2	77.7
5	29.0	27.9	19.5	15.6	57.6	9.80	45.7	11.3	9.80	45.2	35.0	160
6	26.8	21.5	18.5	18.5	13.9	9.00	36.2	17.5	13.9	31.3	35.0	556
7	24.6	19.5	17.5	*20.5	12.2	8.20	*37.8	11.3	88.6	25.7	48.6	164
8	23.5	18.5	16.5	108	11.3	*33.7	45.6	9.80	25.7	22.5	35.0	108
9	22.5	16.5	15.6	47.8	10.5	28.8	33.8	9.80	22.5	21.5	89.6	84.5
10	23.6	17.5	77.7	26.8	10.5	69.3	30.1	13.9	17.5	43.3	a210	71.8
11	22.5	17.5	26.5	20.5	9.80	75.4	27.9	12.2	14.7	29.0	112	63.8
12	19.5	16.5	17.5	19.5	9.00	29.0	25.7	9.80	13.9	22.5	65.4	94.4
13	17.5	22.5	15.6	179	9.00	18.5	24.6	9.00	13.0	101.0	67.0	80.6
14	16.5	14.7	13.9	42.0	8.20	14.7	22.5	8.20	11.3	38.8	58.8	57.5
15	15.6	13.0	*13.0	29.0	8.20	13.9	20.5	7.50	11.3	29.0	118	335
16	15.6	13.0	12.2	24.6	8.20	176	19.5	7.50	17.5	26.8	a290	*132
17	19.5	233	12.2	22.5	8.20	325	18.5	9.80	10.5	24.6	90.2	80.7
18	14.7	57.4	10.5	19.5	8.20	80.6	18.5	9.00	9.80	60.6	71.8	65.4
19	13.9	30.1	10.5	18.5	9.00	42.9	17.5	8.20	9.80	*41.4	93.0	57.5
20	67.4	26.8	9.00	17.5	9.00	35.0	16.5	366	9.80	*31.3	a120	72.9
21	20.5	153	9.80	16.5	8.20	29.0	15.6	53.2	9.80	27.9	a300	887
22	15.6	294	9.00	15.6	8.20	27.9	14.7	22.5	16.4	25.7	a450	151
23	19.5	166	9.00	14.7	*8.20	24.6	14.7	18.5	*20.5	24.6	a350	*1360
24	14.7	65.4	9.00	18.5	7.50	18.5	14.7	*16.5	16.5	23.5	211	264
25	16.5	48.6	9.00	14.7	7.50	15.6	13.9	13.9	13.9	22.5	*125	144
26	16.6	38.8	13.9	13.0	6.80	29.6	13.0	13.0	13.0	23.5	122	119
27	224	*33.8	45.0	13.0	6.80	47.2	13.0	13.0	11.3	24.6	91.6	124
28	42.0	30.1	14.0	*12.2	8.20	27.9	*13.0	13.9	9.80	20.5	71.8	244
29	*27.4	27.9	272	10.5	13.0	22.5	12.2	---------	12.0	45.0	63.8	*115
30	24.6	26.8	140	11.3	17.5	20.5	14.7	---------	46.2	31.3	56.0	92.1
31	22.5	24.6	---------	12.2	---------	23.5	11.3	---------	17.5	---------	51.6	---------
Total	955.4	1,637.5	926.00	883.5	341.50	1,306.20	1,047.7	729.90	538.70	1,114.6	3,921.9	6,164.7
Mean	30.8	52.8	30.9	28.5	11.4	42.1	33.8	26.1	17.4	37.2	127	205
Ac-ft	1,900	3,250	1,840	1,750	677	2,590	2,080	1,450	1,070	2,210	7,780	12,230

Calendar year 1964: Max 1,080 Min 6.80 Mean 49.9 Ac-ft 36,230
Fiscal year 1964-65: Max 1,360 Min 6.80 Mean 53.6 Ac-ft 38,830

Peak discharge (base, 3,000 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
6-21	1030	9.16	8,100	6-23	1800	9.35	8,430

* Discharge measurement made on this day.
a No gage-height record.

8848. Fun-gawa near Aha

Location.--Lat 26°44'33" N., long 128°16'53" E., on right bank 50 ft downstream from bridge, 2.0 miles north of Aha School, and 2.2 miles west of Ada.

Drainage area.--3.3 sq mi, approximately.

Records available.--February 1964 to June 1965.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 380 ft (from topographic map).

Extremes.--Maximum discharge during year, 4,830 cfs June 23 (gage height, 15.86 ft), from rating curve extended above 1,300 cfs as explained below; minimum, 3.50 cfs Nov. 27, 28.

1964-65: Maximum discharge, 5,710 cfs June 16, 1964 (gage height, 17.62 ft), from rating curve extended above 1,300 cfs on basis of slope-area measurement at gage height 18.1 ft; minimum, 3.50 cfs Apr. 21-23, 26-28, Nov. 27, 28, 1964.

Flood of Oct. 25, 1963, reached a stage of 18.1 ft, from floodmarks, and that of Dec. 2, 1963, a stage of 21.5 ft, from floodmarks (discharge, 5,950 and 7,650 cfs, respectively, from rating curve extended above 1,300 cfs on basis of slope-area measurement at gage height 18.1 ft). Minimum discharge known, 2.50 cfs Oct. 22, 1963, result of discharge measurement.

Remarks.--Records good except those for period of no gage-height record, which are fair. No diversion above station. Sediment samples are being obtained during high flows.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Backwater from debris Oct. 22-28)

1.46	3.50	3.0	89.0
1.5	4.20	4.0	215
1.7	8.90	5.0	405
2.0	19.3	6.0	670
2.5	48.0		

Discharge, in cubic feet per second, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	*15.5	6.80	8.10	13.7	5.20	4.00	6.30	6.30	6.0	6.80	7.30	18.5
2	*14.8	6.30	7.30	9.80	5.40	3.80	6.08	5.20	7.0	7.80	29.6	32.0
3	13.7	11.4	7.00	8.10	5.40	4.00	92.8	5.00	6.2	28.3	103	72.4
4	13.0	10.5	6.80	7.80	5.76	4.78	76.4	4.78	5.8	72.7	14.1	30.1
5	12.3	6.80	6.30	7.00	14.8	3.80	16.3	5.20	5.4	17.3	11.3	50.4
6	11.6	6.08	6.30	7.50	5.40	3.80	14.1	6.80	8.0	12.6	11.3	202
7	11.0	6.08	6.08	*7.30	5.00	4.00	*14.6	5.00	35	10.7	12.6	55.7
8	10.4	5.80	5.80	60.9	5.00	10.6	13.9	4.78	12	9.50	11.1	39.8
9	9.80	5.60	5.80	25.0	4.78	*13.3	11.3	4.57	9.2	8.90	40.9	31.5
10	9.80	5.40	15.4	12.0	4.78	*37.4	10.4	5.40	8.0	22.9	90.0	27.1
11	9.50	5.40	6.80	9.80	4.57	*19.5	9.50	4.78	7.0	12.6	32.7	24.0
12	8.70	5.80	5.80	8.70	4.57	9.80	8.90	4.57	6.6	9.80	19.3	37.1
13	8.40	5.60	5.40	81.0	4.36	6.50	8.40	4.57	6.0	44.8	28.9	27.9
14	8.10	5.20	5.20	15.1	4.20	5.00	8.10	4.36	6.0	14.8	21.7	21.2
15	7.80	5.00	*5.20	11.3	4.20	5.00	7.80	4.36	5.8	11.9	45.3	153
16	8.10	5.38	5.20	10.1	4.00	106	7.30	4.36	7.0	10.7	67.0	*40.6
17	8.10	29.3	5.20	9.50	4.00	113	7.30	4.57	5.6	10.1	28.2	25.0
18	7.30	11.9	5.00	8.40	3.80	25.9	7.00	4.57	5.4	19.0	23.1	21.2
19	7.00	7.00	4.78	7.80	4.00	13.7	7.00	4.36	5.2	*13.0	34.0	18.9
20	22.2	6.80	4.78	7.50	3.80	10.7	6.50	113	5.2	10.4	24.0	20.8
21	7.80	52.9	4.57	7.30	3.80	9.20	6.08	13.2	5.0	9.80	119	324
22	6.80	248	4.57	7.30	3.80	8.70	6.08	7.30	5.4	8.90	140	39.2
23	6.50	60.2	4.36	7.00	*3.80	8.10	5.80	7.50	*7.0	8.70	154	500
24	6.30	18.5	4.36	9.04	3.80	7.30	5.80	*7.0	8.08	8.40	63.9	73.8
25	7.30	14.1	4.57	6.50	3.65	6.80	5.60	6.6	6.08	7.50	*40.4	44.5
26	10.1	11.9	7.73	6.08	3.65	8.10	5.60	6.2	5.80	7.50	33.8	35.0
27	51.1	*10.4	15.7	6.08	3.50	14.9	5.40	6.2	5.40	7.30	28.7	40.3
28	10.1	9.80	5.80	*5.92	3.50	8.40	*5.20	6.6	5.00	7.00	25.6	56.3
29	*7.80	8.90	205	5.60	4.00	7.00	5.40	---------	5.82	13.3	23.1	32.1
30	7.50	8.40	40.8	5.60	4.78	6.80	5.80	---------	25.3	8.90	20.7	27.1
31	7.00	7.80	---------	5.40	---------	7.50	5.20	---------	7.80	---------	18.9	---------
Total	345.40	609.04	425.70	400.12	141.30	497.38	401.94	267.13	249.08	441.90	1323.50	2121.5
Mean	11.1	19.6	14.2	12.9	4.71	16.0	13.0	9.54	8.03	14.7	42.7	70.7
Ac-ft	685	1210	844	794	280	987	797	530	494	876	2630	4210

Calendar year 1964:	Max	-	Min	-	Mean	-	Ac-ft	-
Fiscal year 1964-65:	Max	500	Min	3.50	Mean	19.8	Ac-ft	14340

Peak discharge (base, 1,200 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
8-22	1900	10.72	2,440	6-15	1630	8.90	1,710
9-29	0630	8.45	1,530	6-21	1100	12.64	3,290
5- 3	0230	8.29	1,470	6-23	1600	15.86	4,830

* Discharge measurement made on this day.
Note.--No gage-height record Feb. 24 to Mar. 23.

9060. Vaitolu Stream at Aoa

Location (revised).--Lat 14°16'19" S., long 170°35'32" W., on left bank 0.5 mile upstream from mouth and 0.7 mile southwest of Aoa.

Drainage area.--0.16 sq mi (revised).

Records available.--March 1958 to June 1965. Prior to July 1961, published as "near Aoa."

Gage.--Water-stage recorder. Altitude of gage is 190 ft (revised, from topographic map).

Average discharge.--7 years, 0.330 mgd (0.511 cfs).

Extremes.--Maximum discharge during year, 86.0 mgd (133 cfs) Sept. 16 (gage height, 4.80 ft), from rating curve extended above 2.1 mgd as explained below; no flow Oct. 31, Nov. 3.
1958-65: Maximum discharge, 154 mgd (238 cfs) Dec. 19, 1962 (gage height, 6.16 ft), from rating curve extended above 2.1 mgd by logarithmic plotting; no flow Oct. 31, Nov. 3, 1964.

Remarks.--Records good except those for periods of no gage-height record and those above 5 mgd, which are fair. Small diversion above station for domestic use since Sept. 14, 1964.

Rating table (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used Apr. 28 to May 3)

1.03	0	1.5	1.45
1.1	.03	1.6	2.18
1.2	.19	1.9	4.95
1.3	.48	2.3	10.4
1.4	.90		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.19	0.21	a0.03	0.05	0.02	0.46	1.55	0.03	0.07	0.03	0.11	0.14
2	.19	.16	a.04	.05	.08	.05	3.27	.11	.06	.05	.04	*.14
3	.19	.14	a.04	.06	0	.05	1.87	.08	.04	.14	.03	.12
4	.19	.16	a.03	.05	.01	2.67	2.15	.37	.03	1.56	.15	.10
5	.19	.14	a.07	.22	.02	.34	.66	.52	.05	.24	.04	.08
6	.21	.14	a.05	.53	.06	.23	a.6	.72	.03	.14	.03	.07
7	1.36	.14	a.03	.03	.02	.19	*.48	.08	.02	.06	.03	.06
8	.65	.21	a.02	.06	.01	.19	.26	*.08	*.02	.32	.03	.07
9	.35	.16	a.07	.12	*.04	.57	.43	.05	1.19	.06	.04	1.17
10	.40	.48	a.06	.05	.01	.42	.19	.06	1.03	.05	.06	3.55
11	.43	.16	a.05	.02	.01	.38	.10	.05	.48	.06	.03	1.10
12	.99	.14	a.04	.02	.01	.15	.07	.50	.08	.12	.02	.46
13	.81	.67	a.02	.06	.02	.07	.06	.06	.05	.03	.04	2.20
14	*.52	.59	.01	.03	.02	1.46	.05	.04	.29	.05	.25	.35
15	.38	.26	.10	.04	.27	1.06	.05	.06	.06	.06	.07	.14
16	.29	.26	9.12	.03	.03	.38	.05	5.00	.06	.27	.04	.23
17	.26	.21	.56	.05	.95	.26	.04	.52	.04	.16	.03	.16
18	.26	.08	.08	.05	.19	.12	.05	.16	.05	.04	.03	.05
19	.23	.07	.05	*.10	.16	.10	.08	.46	.04	1.10	.04	.05
20	.23	.05	.05	.02	.57	.06	.10	.21	.04	1.43	.03	.15
21	.21	.12	.27	.04	.26	.14	.12	.06	.02	.29	.32	.19
22	.21	.08	.30	.06	.06	.05	.12	.05	.01	.34	.04	.83
23	.21	.05	.07	.08	.89	.12	.12	.07	.01	.19	.28	.14
24	.19	.06	.04	.03	.95	.07	.05	.33	.02	.21	.77	.05
25	.21	.06	.03	.02	.23	.08	.10	.43	.02	1.02	.33	.05
26	.21	.07	.04	.07	.23	.04	.06	.12	.01	.38	.12	.05
27	.19	.06	.06	.07	.10	1.63	.04	.12	.01	.21	.35	.04
28	.16	.09	.06	.03	.02	.55	.06	.08	.01	1.63	.12	.04
29	.19	.06	.06	.03	.36	.14	.06	---------	.01	.32	.12	.03
30	.30	.03	.05	.02	.86	.18	.07	---------	.02	.18	1.27	.03
31	.38	.03	---------	0	---------	.22	.19	---------	.02	---------	.12	---------
Total	10.78	5.14	11.50	2.09	6.46	12.43	13.10	10.42	3.89	10.74	4.98	11.84
Mean												
Mgd	0.348	0.166	0.383	0.067	0.215	0.401	0.423	0.372	0.125	0.358	0.161	0.395
Cfs	0.538	0.257	0.593	0.104	0.333	0.620	0.654	0.576	0.193	0.554	0.249	0.611
Ac-ft	33	16	35	6.4	20	38	40	32	12	33	15	36

Calendar Year 1964:	Max	9.12	Min	0	Mean mgd	0.311	Mean cfs	0.481	Ac-ft	348
Fiscal Year 1964-65:	Max	9.12	Min	0	Mean mgd	0.283	Mean cfs	0.438	Ac-ft	316

* Discharge measurement made on this day.
a No gage-height record.

Peak discharge (base, 40 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
9-16	0730	4.80	86.0	133	3- 9	1130	3.77	46.4	71.8
12- 4	0300	4.36	67.1	104	6-10	0100	3.97	53.4	82.6
1- 2	1600	3.87	50.0	77.4	6-13	0430	4.33	66.0	102
2-16	0300	3.60	41.0	63.4					

9120. Pago Stream at Afono
(Formerly published as Afono Stream at Afono)

Location (revised).--Lat 14°16'03" S., long 170°39'02" W., on left bank 0.2 mile south of Afono and 0.3 mile upstream from mouth.

Drainage area.--0.60 sq mi (revised).

Records available.--October 1958 to June 1965. Prior to July 1964, published as Afono Stream at Afono.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 30 ft (revised, from topographic map).

Average discharge.--6 years (1959-65), 2.20 mgd (3.40 cfs).

Extremes.--Maximum discharge during year, 358 mgd (554 cfs) Sept. 16 (gage height, 4.36 ft), from rating curve extended above 14 mgd as explained below; minimum, 0.23 mgd (0.36 cfs) Nov. 14.
1958-65: Maximum discharge, 490 mgd (758 cfs) May 9, 1964 (gage height, 4.70 ft), from rating curve extended above 14 mgd by logarithmic plotting; minimum, 0.16 mgd (0.25 cfs) Sept. 30, 1961.

Remarks.--Records good except those above 30 mgd, which are fair. About 0.04 mgd diverted above station for domestic use in Afono.

Rating table (gage height, in feet, and discharge, in million gallons a day)

1.4	0.14	1.9	4.83
1.5	.44	2.0	7.06
1.6	.99	2.3	17.5
1.7	1.86	2.6	35.5
1.8	3.17	2.9	62.0

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.56	1.47	0.52	*0.92	0.44	3.77	2.44	0.92	0.92	0.44	1.76	2.07
2	1.14	.92	.57	.92	.52	3.17	11.4	.92	.86	3.48	1.76	1.66
3	.92	.80	.57	.86	.48	1.66	10.7	1.14	.80	2.07	1.47	1.47
4	.86	.80	.52	.92	.44	1.96	9.01	4.33	.74	16.2	1.29	1.21
5	.80	.74	.68	1.21	.40	17.1	6.74	2.72	.92	3.77	1.21	1.14
6	1.04	.68	.57	1.29	.40	3.32	3.92	5.84	.80	2.72	1.14	.99
7	3.72	.62	.52	.86	.40	2.07	2.87	2.07	.74	2.31	1.21	.92
8	2.44	.80	.44	.74	.44	1.66	2.19	1.47	.74	1.86	1.06	.93
9	1.66	.74	.68	.68	.48	1.76	2.44	1.14	.80	1.47	.99	5.20
10	1.66	1.80	.62	.62	.40	6.83	1.66	1.06	1.99	1.21	.92	9.30
11	2.19	1.14	.52	.62	.36	4.46	1.47	.99	1.96	1.06	.92	6.39
12	8.84	.80	.48	.62	.36	3.92	1.21	2.51	1.06	1.06	.86	3.17
13	4.46	3.47	.52	.57	*.36	2.72	1.14	1.38	1.06	.92	1.88	3.62
14	3.92	3.17	.48	.57	.29	1.86	*1.14	1.06	2.19	.92	5.06	3.92
15	2.44	1.29	1.28	.57	1.48	10.3	1.06	1.06	1.21	2.31	8.36	3.62
16	1.86	1.21	54.6	.52	.52	6.37	1.29	16.7	*.99	2.38	3.02	3.17
17	1.66	.99	5.03	.48	.57	3.62	1.06	3.62	.92	4.11	*1.86	2.57
18	1.47	.86	2.57	.52	1.66	2.44	.99	2.07	.86	1.96	1.56	1.96
19	1.29	.80	1.86	.86	1.38	1.86	.92	1.96	.80	2.41	1.47	1.66
20	1.21	.80	1.56	.57	1.86	1.56	.92	2.57	.74	5.34	1.14	3.26
21	1.14	.80	5.13	.57	1.45	1.29	.86	1.86	.86	2.19	3.75	2.57
22	.99	.62	4.10	.52	2.48	1.14	.86	1.38	.74	1.76	2.07	3.62
23	.92	.68	2.31	.52	.99	1.06	.80	1.21	.68	1.86	4.11	2.72
24	.86	1.21	3.11	.48	16.1	1.06	.99	1.47	.62	6.87	6.90	1.66
25	.92	.74	2.44	.44	2.87	.92	1.14	1.29	.62	12.1	2.87	1.38
26	.92	.74	1.56	.44	1.56	.99	1.06	1.14	.57	4.46	1.96	1.14
27	*.86	.74	1.29	.40	1.21	.86	.99	.99	.57	2.72	1.76	1.14
28	.80	.68	1.14	.40	.92	6.41	.99	1.06	.52	6.46	1.76	1.06
29	.80	.57	1.06	.44	.86	3.47	.92	---------	.48	3.47	1.66	.92
30	1.21	.57	1.06	.52	2.58	1.56	.74	---------	.57	2.31	10.8	.92
31	2.17	.52	---------	.44	---------	1.29	.80	---------	.52	---------	3.32	---------
Total	56.73	31.77	97.79	20.09	44.26	102.46	74.72	65.93	27.85	102.20	79.90	75.36
Mean												
Mgd	1.83	1.02	3.26	0.648	1.48	3.31	2.41	2.35	0.898	3.41	2.58	2.51
Cfs	2.83	1.58	5.04	1.00	2.21	5.12	3.73	3.64	1.39	5.28	3.99	3.88
Ac-ft	174	97	300	62	136	314	229	202	85	314	245	231

Calendar Year 1964:	Max	54.6	Min	0.29	Mean mgd	2.18	Mean cfs	3.37	Ac-ft	2450
Fiscal Year 1964-65:	Max	54.6	Min	0.29	Mean mgd	2.13	Mean cfs	3.30	Ac-ft	2390

* Discharge measurement made on this day.

Peak discharge (base, 110 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
9-16	0830	4.36	358	554	12-5	0230	3.63	170	263
11-24	1130	3.62	168	260					

9205. Aasu Stream at Aasu

Location (revised).--Lat 14°17'51" S., long 170°45'30" W., on right bank at Aasu and 200 ft upstream from mouth.

Drainage area.--1.03 sq mi (revised).

Records available.--October 1958 to June 1965.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 5 ft (by hand levels from high-tide mark).

Average discharge.--6 years (1959-65), 4.08 mgd (6.31 cfs).

Extremes.--Maximum discharge during year, 315 mgd (487 cfs) May 15 (gage height, 4.25 ft), from rating curve extended above 9.4 mgd as explained below; minimum, 0.59 mgd (0.91 cfs) Nov. 17.
1958-65: Maximum discharge, 415 mgd (642 cfs) Aug. 10, 1962 (gage height, 4.72 ft), from rating curve extended above 9.4 mgd by logarithmic plotting; minimum, 0.32 mgd (0.50 cfs) Sept. 29 to Oct. 1, 1961.

Remarks.--Records good except those for periods of no gage-height record and those above 20 mgd, which are fair. Small diversion above station for domestic use. Continuous records of rainfall are obtained at station.

Rating table (gage height, in feet, and discharge, in million gallons a day)

1.3	0.63	1.7	6.60
1.4	1.32	2.0	17.4
1.5	2.58	2.3	34.0
1.6	4.34		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.58	1.57	1.22	5.60	1.12	4.16	7.29	1.82	2.33	1.22	4.34	4.79
2	2.20	1.22	1.22	3.64	1.03	3.81	9.5	2.33	2.08	1.12	3.99	4.34
3	2.08	1.12	1.5	27.0	1.12	2.93	11	3.0	1.95	1.34	3.11	3.99
4	1.95	1.12	1.8	9.00	1.03	2.76	12.3	6.5	1.70	8.10	2.76	3.64
5	1.82	1.03	1.5	7.50	.88	5.33	9.98	8.0	1.70	3.99	2.58	3.28
6	1.70	.95	1.1	7.20	.88	3.81	8.10	10	1.57	2.93	2.58	2.93
7	2.33	.88	.9	5.92	.88	2.91	6.90	5.6	1.45	2.20	2.45	2.76
8	2.67	1.03	.8	5.02	.88	2.76	5.92	6.4	1.45	2.20	2.33	2.76
9	2.33	.95	3.5	4.34	.88	2.45	5.70	4.8	1.57	3.07	2.20	6.45
10	3.72	1.45	1.0	3.99	.88	9.94	5.02	4.0	1.96	2.58	2.08	7.38
11	3.64	1.12	2.5	4.02	.77	7.50	4.16	5.4	1.82	2.20	1.95	5.02
12	7.56	.88	2.0	3.81	.72	9.00	3.99	11	1.70	2.20	1.82	3.99
13	6.60	8.62	1.5	3.28	.72	5.92	3.64	4.79	3.47	1.95	2.20	3.99
14	5.47	4.79	1.0	2.93	.67	6.59	3.28	3.99	3.81	3.47	14.0	4.79
15	4.34	2.45	5.6	2.58	.77	13.4	2.93	3.81	2.33	4.94	18.5	6.15
16	3.81	2.58	30	2.33	.67	19.6	3.11	12.7	2.32	3.99	8.40	5.24
17	3.46	2.33	10	2.20	.67	11.1	2.45	6.37	2.93	9.46	5.70	4.57
18	3.11	1.82	7.0	2.08	2.20	7.80	4.0	5.02	2.93	4.79	4.79	5.39
19	2.93	1.70	4.8	4.36	1.57	6.37	2.45	6.0	2.93	3.99	5.02	7.58
20	2.93	1.70	4.5	2.45	1.82	5.47	2.33	5.4	2.20	3.99	4.34	28.5
21	2.58	1.82	9.0	2.08	1.22	4.9	2.20	5.02	2.08	3.11	8.01	13.4
22	2.33	1.57	7.0	1.82	.95	*4.79	1.82	4.34	2.45	2.58	5.02	11.5
23	2.08	1.57	5.6	1.82	.88	4.16	1.70	3.99	2.08	2.58	6.15	9.60
24	1.95	2.76	7.0	1.57	16.2	5.91	3.5	3.64	1.82	3.11	11.1	7.50
25	1.82	1.70	6.0	1.32	5.86	3.99	2.9	*3.11	1.70	7.90	6.15	6.37
26	1.82	1.57	5.0	1.22	4.16	3.28	2.45	2.93	1.57	4.57	5.70	6.15
27	1.70	1.70	5.4	1.12	3.99	2.93	2.93	2.93	1.57	*3.46	8.40	5.70
28	1.45	1.70	*4.57	1.12	3.28	7.70	2.08	3.62	1.95	3.99	7.20	5.24
29	1.32	1.32	3.99	1.32	3.26	5.70	2.20	---------	1.57	3.28	5.47	4.57
30	3.39	1.22	3.81	1.57	4.16	4.57	1.70	---------	1.57	3.64	6.90	4.16
31	2.20	1.12	---------	1.12	---------	5.39	1.70	---------	1.32	---------	6.15	---------
Total	89.87	57.36	140.81	125.33	64.12	186.93	139.23	146.51	63.88	107.95	171.39	191.73
Mean												
Mgd	2.90	1.85	4.69	4.04	2.14	6.03	4.49	5.23	2.06	3.60	5.53	6.39
Cfs	4.49	2.86	7.25	6.25	3.31	9.33	6.95	8.09	3.19	5.57	8.56	9.89
Ac-ft	276	176	432	385	197	574	427	450	196	331	526	588

Calendar Year 1964:	Max	30	Min	0.67	Mean mgd	3.57	Mean cfs	5.52	Ac-ft	4010
Fiscal Year 1964-65:	Max	30	Min	0.67	Mean mgd	4.07	Mean cfs	6.30	Ac-ft	4560

Peak discharge (base, 100 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
9-16	about 1300	3.43	154	238	11-24	1130	3.17	119	184
10- 3	0530	3.94	253	391	5-15	1400	4.25	315	487
					6-20	0600	3.07	107	166

* Discharge measurement made on this day.
Note.--No gage-height record Sept. 3-27, Dec. 21, Jan. 2, 3, 18, 24, 25, Feb. 3-12, 19, 20.

9310. Atauloma Stream at Afao

Location (revised).--Lat 14°20'10" S., long 170°48'02" W., on left bank at Afao, 100 ft upstream from highway bridge, and 300 ft upstream from mouth.

Drainage area.--0.24 sq mi (revised).

Records available.--October 1958 to June 1965.

Gage.--Water-stage recorder. Altitude of gage is 20 ft (by hand levels from high-tide mark).

Average discharge.--6 years (1959-65), 0.93 mgd (1.44 cfs).

Extremes.--Maximum discharge during year, 249 mgd (385 cfs) June 20 (gage height, 3.47 ft), from rating curve extended above 5.3 mgd as explained below; minimum, 0.17 mgd (0.26 cfs) Nov. 13-15.
1958-65: Maximum discharge, 253 mgd (391 cfs) Aug. 12, 1962 (gage height, 3.48 ft), from rating curve extended above 5.3 mgd by logarithmic plotting; minimum, 0.04 mgd (0.06 cfs) Oct. 21, 1963.

Remarks.--Records good except those for period of no gage-height record and those above 20 mgd, which are fair. Diversion above station for use at Atauloma School averages 10,400 gallons per day. Continuous records of rainfall are obtained at station.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.4	0.08	0.9	2.95
.5	.26	1.1	6.10
.6	.60	1.3	10.8
.7	1.13	1.6	21.8
.8	1.89		

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.60	0.55	0.33	0.51	0.42	*1.51	1.61	0.44	0.40	0.51	1.06	0.78
2	.51	.40	.31	.48	.37	.94	3.13	.48	.37	.34	.94	.68
3	.44	.34	.31	1.77	*.55	.68	3.66	.78	.37	.34	.89	.64
4	.44	.31	.34	.78	.37	.60	2.95	2.26	.34	2.14	.60	.55
5	.40	.31	.31	*.68	.26	1.43	2.63	2.62	.34	1.06	.48	.51
6	.40	.31	.28	.64	.26	.73	1.66	2.14	.34	.68	*.48	.51
7	.48	.28	.23	.51	.23	.60	1.21	1.56	.34	.51	.44	.51
8	.48	.34	.21	.44	.23	.55	.94	1.59	.34	.51	.70	.51
9	.44	.34	.54	.40	.26	.51	.89	.89	.34	.40	.51	2.82
10	.91	.48	.26	.37	.21	2.10	.73	.73	.34	.48	.44	*2.78
11	1.00	.37	a.4	.40	.21	1.81	.68	.64	.37	.37	.40	1.21
12	1.48	.31	a.3	.44	.23	1.43	.64	1.94	.28	.40	.37	.83
13	2.55	3.29	a.3	.37	.19	.94	.60	.83	.39	.34	.50	2.31
14	1.66	1.51	.27	.34	.17	1.27	.60	.60	.54	.31	1.91	1.66
15	.94	.64	1.75	.34	.44	3.11	.51	.64	.48	.65	1.00	2.00
16	.68	.64	18.3	.37	.21	5.45	.55	2.71	.73	.48	.73	1.51
17	.60	.51	2.21	.34	*.74	*2.07	.51	*1.28	.68	1.01	.73	1.13
18	.51	.40	1.28	.31	1.65	1.28	1.67	.89	.44	2.35	.64	.89
19	.48	.37	.89	.73	1.06	.94	.83	1.19	.40	1.06	.64	1.75
20	.48	.40	.80	.37	1.84	.73	.68	.94	.40	.78	.55	21.0
21	.40	.40	4.06	.34	.83	.68	.55	.73	.84	.51	3.61	2.84
22	.34	.31	1.74	.53	.48	.82	.51	.60	.44	.40	1.13	1.89
23	.34	.48	1.00	.37	.46	.55	.48	.55	.34	.44	1.28	1.43
24	.34	1.22	1.95	.31	8.14	.51	.87	.51	.26	1.10	1.91	1.06
25	.34	.51	1.13	.26	1.89	.44	.73	.48	.29	.68	1.13	.89
26	.37	.48	.83	.26	1.43	.40	.73	.48	.31	.51	1.15	.78
27	.34	.40	.97	.23	.89	.40	.77	.48	.28	.48	1.51	.73
28	.31	.44	.68	.26	.68	1.36	.51	.48	.45	.48	1.28	.64
29	.28	.34	.60	.43	.65	.89	*.51	---------	.31	.44	.89	.64
30	1.29	.31	.51	.43	1.31	.68	.44	---------	.34	.85	1.30	.60
31	.78	.28	---------	.28	---------	1.10	.51	---------	.55	---------	1.00	---------
Total	20.61	17.27	43.09	14.29	26.66	36.51	33.29	29.46	12.64	20.61	30.20	56.08
Mean Mgd	0.665	0.557	1.44	0.461	0.889	1.18	1.07	1.05	0.408	0.687	0.974	1.87
Cfs	1.03	0.862	2.23	0.713	1.38	1.83	1.66	1.62	0.631	1.06	1.51	2.89
Ac-ft	63	53	132	44	82	112	102	90	39	63	93	172

Calendar Year 1964:	Max	18.3	Min	0.15	Mean mgd	0.884	Mean cfs	1.37	Ac-ft	992		
Fiscal Year 1964-65:	Max	21.0	Min	0.17	Mean mgd	0.933	Mean cfs	1.44	Ac-ft	1,040		

* Discharge measurement made on this day.
a No gage-height record.

Peak discharge (base, 70 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
9-16	1300	3.19	193	299	6-20	0530	3.47	249	385
11-24	1100	2.33	72.0	111					

9480. Afuelo Stream at Matuu

Location (revised).--Lat 14°18'07" S., long 170°41'07" W., on left bank 0.2 mile northwest of Matuu and 0.3 mile upstream from mouth.

Drainage area.--0.25 sq mi (revised).

Records available.--March 1958 to June 1965. Prior to July 1962, published as Matuu Stream at Matuu.

Gage.--Water-stage recorder. Altitude of gage is 80 ft (revised, from topographic map).

Average discharge.--7 years, 0.981 mgd (1.52 cfs).

Extremes.--Maximum discharge during year, 119 mgd (184 cfs) July 12 (gage height, 2.88 ft), from rating curve extended above 5.4 mgd as explained below; minimum, 0.12 mgd (0.19 cfs) Sept. 14.
1958-65: Maximum discharge, 262 mgd (405 cfs) May 17, 1962 (gage height, 3.70 ft), from rating curve extended above 5.4 mgd by logarithmic plotting; minimum, 0.07 mgd (0.11 cfs) Sept. 29, 30, 1961.

Remarks.--Records good except those above 20 mgd, which are fair. No diversion above station.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.6	0.14	1.1	2.87
.7	.34	1.2	4.25
.8	.64	1.4	8.20
.9	1.09	1.6	14.1
1.0	1.81	1.9	27.3

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.64	0.48	0.17	0.89	0.21	2.76	2.66	0.42	0.25	0.25	0.96	0.86
2	.34	.29	.17	.50	*.17	1.98	4.02	.34	.21	.29	.78	.78
3	.27	.23	.19	4.97	.21	.78	7.79	.54	.19	1.00	.64	.64
4	.25	.25	.19	.78	.17	.56	2.76	2.59	.17	5.35	.69	.56
5	.23	.23	.33	1.36	.17	7.77	2.23	1.86	.17	1.31	.54	.50
6	.27	.21	.21	1.81	.17	1.00	1.31	2.35	.17	.78	.44	.50
7	2.75	.19	.17	.73	.16	.60	.78	.78	.17	.56	.42	.44
8	1.23	.31	.16	.50	.19	.54	.60	.68	.19	.60	.68	1.08
9	.73	.34	.19	.39	.27	.82	.60	.50	.36	.54	.54	3.72
10	1.33	.67	.19	.36	.17	4.03	.44	.39	1.63	.39	.91	6.59
11	1.59	.31	.16	.41	.17	2.22	.39	.34	.73	.31	.60	2.13
12	8.19	.25	.16	.36	.16	2.33	.34	2.48	.43	.36	.42	1.23
13	3.33	2.22	.14	.29	.16	.96	.29	.78	4.19	.57	.65	1.74
14	1.81	1.42	.17	.29	.16	.82	.29	.42	2.31	.42	3.29	1.59
15	1.00	.48	1.79	.27	.25	*4.58	.27	.42	.73	2.06	13.3	1.59
16	.68	.54	24.0	.29	.17	4.26	.38	7.16	.53	1.31	1.81	1.52
17	.54	.48	1.78	.27	.17	1.45	.25	1.23	.73	2.79	1.09	.86
18	.44	.31	.91	.27	1.04	.78	.23	.64	.64	.78	.78	.64
19	.39	.25	.56	1.32	.60	.54	.27	.73	*.61	1.55	.73	.93
20	.34	.23	.60	.54	.79	.42	.23	.73	.66	2.40	.64	2.50
21	.34	.27	6.54	.29	.39	.36	*.21	.44	2.39	.78	3.32	1.31
22	.29	.19	1.84	.25	.50	.34	.27	.39	1.13	.54	1.00	*1.45
23	.27	.17	.96	.29	.37	.29	.21	.31	.64	.96	4.78	1.45
24	.27	.79	1.35	.23	7.47	.27	.31	.34	.60	3.79	4.27	.78
25	.25	.27	1.00	.21	*1.32	.25	.45	.27	.44	5.51	1.67	.56
26	.27	.21	.73	.19	.56	.27	.46	.23	.31	1.59	*1.09	.50
27	.23	.27	.56	.17	.54	.23	.73	.37	.34	.78	1.86	.44
28	.21	.29	.42	.17	.31	1.87	.39	.45	.42	2.90	1.16	.42
29	.21	.19	.39	.21	.39	.78	.56	---------	.29	1.23	.78	.39
30	.96	.19	.39	.19	1.59	.54	.27	---------	.39	.96	3.45	.34
31	.82	.17	---------	.17	---------	3.10	.44	---------	.29	---------	1.31	---------
Total	30.47	12.70	46.42	18.97	19.00	47.50	30.43	28.18	22.31	42.66	54.60	38.04
Mean												
Mgd	0.983	0.410	1.55	0.612	0.633	1.53	0.982	1.01	0.720	1.42	1.76	1.27
Cfs	1.52	0.634	2.40	0.947	0.979	2.37	1.52	1.56	1.11	2.20	2.72	1.96
Ac-ft	94	39	142	58	58	146	93	36	68	131	168	117

Calendar Year 1964:	Max	24.0	Min	0.11	Mean mgd	0.945	Mean cfs	1.46	Ac-ft	1.060
Fiscal Year 1964-65:	Max	24.0	Min	0.14	Mean mgd	1.07	Mean cfs	1.66	Ac-ft	1.200

* Discharge measurement made on this day.

Peak discharge (base, 70 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-12	1300	2.88	119	184	11-24	1030	2.60	84.0	130
9-16	0700	2.82	111	172	1- 3	1630	2.68	93.6	145
10- 3	0230	2.47	71.0	110	5-15	0500	2.72	98.4	152

9600. Alega Stream at Alega
(Formerly published as West Branch Alega Stream at Alega)

Location (revised).--Lat 14°16'58" S., long 170°38'19" W., on left bank 0.2 mile northwest of Alega and 0.3 mile upstream from mouth.

Drainage area.--0.19 sq mi (revised).

Records available.--March 1958 to June 1965. Prior to July 1964, published as West Branch Alega Stream at Alega.

Gage.--Water-stage recorder. Altitude of gage is 180 ft (revised, from topographic map).

Average discharge.--7 years, 0.816 mgd (1.26 cfs).

Extremes.--Maximum discharge during year, 29.1 mgd (45.0 cfs) Dec. 5 (gage height, 2.54 ft), from rating curve extended above 3.5 mgd as explained below; minimum, 0.25 mgd (0.39 cfs) Nov. 11-14.
1958-65: Maximum discharge, 73.2 mgd (113 cfs) July 24, 1962 (gage height, 3.47 ft), from rating curve extended above 3.5 mgd by logarithmic plotting; minimum, 0.20 mgd (0.31 cfs) July 11, 12, 1959.

Remarks.--Records good except those for periods of no gage-height record and those above 7 mgd, which are fair. No diversion above station.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.8	0.15	1.2	1.90
.9	.38	1.5	4.90
1.0	.74	1.8	9.55

Discharge, in million gallons a day, fiscal year July 1964 to June 1965

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.48	0.51	0.38	0.51	0.28	1.39	1.06	0.51	0.6	0.38	0.99	1.0
2	.48	.44	.38	.51	.28	1.09	2.81	*.48	.5	1.18	1.04	.9
3	.44	.41	.38	.48	.30	.84	4.05	.6	*55	.86	.94	.8
4	.44	.44	.38	.48	.28	.99	3.05	1.4	.51	4.31	.84	.7
5	.41	.44	.41	.62	.28	4.70	2.60	1.0	.62	1.58	.79	.7
6	.44	.41	.38	.68	*.29	1.39	*1.90	1.9	.51	1.14	.74	.7
7	1.00	.38	.38	.44	.30	*.99	1.64	.9	.48	.94	.70	.7
8	.66	.51	.38	.44	.30	.84	1.26	.7	.48	.99	.66	1.5
9	.58	.44	.38	.41	.30	.74	1.26	.6	.64	.79	.62	2.5
10	.55	.58	.38	.41	.28	1.68	1.04	.5	.90	.66	.62	2.0
11	.96	.48	.38	.41	.28	1.45	.94	.5	.79	.62	.55	1.1
12	3.25	.55	.44	.38	.28	1.14	.84	1.1	.66	.62	.55	1.4
13	1.71	1.15	.44	.38	.28	.89	.79	.6	.70	.58	.70	1.7
14	1.32	.85	.44	*.41	.28	.79	.79	.5	1.26	.55	1.35	1.4
15	.99	.51	.62	.41	.42	2.91	.70	.5	.70	1.05	4.73	1.3
16	.84	.48	9.22	.41	.28	3.14	.74	4.5	.62	1.09	1.98	1.2
17	.74	.44	1.90	.41	.44	1.77	.79	1.5	.62	1.91	1.39	.8
18	.70	.41	1.14	.39	.58	1.26	.66	.8	.58	.89	1.04	.7
19	.66	.41	.89	.38	.41	1.04	.62	.6	.51	1.76	.89	.7
20	.62	.41	.84	.32	.64	.89	.62	1.0	.51	1.87	.84	1.3
21	.58	.41	1.67	.32	.38	.79	.58	.7	.51	1.09	1.73	*1.09
22	.55	.38	1.45	.30	.38	.74	.58	.6	.48	.94	.99	1.14
23	.51	.38	.89	.30	.35	.66	.58	.5	.48	.99	1.50	.99
24	.51	.46	.96	.30	4.24	.66	.62	.7	.44	1.09	2.46	.89
25	.51	*.42	1.39	.30	1.14	.62	.70	.5	.44	2.00	1.45	.84
26	.48	.44	.70	.28	.62	.66	.62	.5	.44	1.39	1.14	.74
27	.48	.44	.66	.28	.58	.62	.62	.5	.44	1.04	*1.04	.70
28	.48	.44	.58	.28	.44	1.90	.62	.5	.41	2.19	.99	.66
29	.48	.41	.55	.28	.49	1.14	.55	---------	.41	1.39	.7	.66
30	.55	.38	.55	.28	1.08	.70	.51	---------	.41	1.14	3.0	.62
31	.79	.38	---------	.28	---------	.73	.58	---------	.41	---------	1.2	---------
Total	23.19	14.79	29.54	12.08	16.48	39.15	34.72	24.69	17.61	37.03	38.16	31.43
Mean												
Mgd	0.748	0.477	0.985	0.390	0.549	1.26	1.12	0.882	0.568	1.23	1.23	1.05
Cfs	1.16	0.738	1.52	0.603	0.849	1.95	1.73	1.36	0.879	1.90	1.90	1.62
Ac-ft	71	45	91	37	51	120	107	76	54	114	117	96

Calendar Year 1964:	Max	9.22	Min	0.28	Mean mgd	0.813	Mean cfs	1.26	Ac-ft	914		
Fiscal Year 1964-65:	Max	9.22	Min	0.28	Mean mgd	0.874	Mean cfs	1.35	Ac-ft	979		

Peak discharge (base, 25 mgd, revised)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-12	1200	2.44	25.8	39.9	4- 4	0500	2.42	25.1	38.8
9-16	1200	2.47	26.7	41.3	5-30	about 0830	2.43	25.5	39.5
12- 5	0200	2.54	29.1	45.0					

* Discharge measurement made on this day.
Note.--No gage-height record Feb. 3 to Mar. 2, May 29 to June 20.

As the number of streams on which streamflow information is likely to be desired far exceeds the number of stream-gaging stations feasible to operate at one time, the Geological Survey collects limited streamflow data at sites other than stream-gaging stations. When limited streamflow data are collected on a systematic basis over a period of years for use in hydrologic analyses, the site at which the data are collected is called a partial-record station. Data collected at these partial-record stations are usable in low-flow or flood-flow analyses, depending on the type of data collected. In addition, discharge measurements are made at other sites not included in the partial-record program. These measurements are generally made in times of drought or flood to give better areal coverage to those events. Those measurements and others collected for some special reason are called measurements at miscellaneous sites.

Records collected at partial-record stations are presented in two tables. The first is a table of discharge measurements at low-flow partial-record stations, and the second is a table of annual maximum stage and discharge at crest-stage stations. Discharge measurements made at miscellaneous sites for both low flow and high flow are given in a third table.

Low-flow partial-record stations

Measurements of streamflow in the area covered by this report made at low-flow, partial-record stations are given in the following table. Most of these measurements were made during periods of base flow when streamflow is primarily from ground-water storage. These measurements, when correlated with the simultaneous discharge of a nearby stream where continuous records are available, will give a picture of the low-flow potentiality of the stream. The column headed "Period of record" shows the fiscal years in which measurements were made at the same, or practically the same, site.

Discharge measurements made at low-flow partial-record stations during fiscal year 1965

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements		
					Date	Discharge	
						Mgd	Cfs
		Island of Oahu					
*2605	Maunawili Stream above Kailua Road, near Kailua	Lat 21°22'49", long 157°45'48", at bridge on old highway, 400 ft above Kalanianaole Highway, and 1.7 miles southwest of Kailua Post Office.	(a) 5.34	1960-62, 1965	6-30-65	4.56	7.06
2641	Kahanaiki Stream at Kailua Road, near Kailua	Lat 21°22'49", long 157°46'06", at Kailua Road and 1.9 miles southwest of Kailua Post Office.	1.45	1960-63, 1965	6-30-65	1.09	1.69
2709	Luluku Stream at altitude 220 ft, near Kaneohe	Lat 21°23'42", long 157°48'46", 1.4 miles southwest of Castle High School and 2.1 miles south of St. Ann's School.	.45	1960-63, 1965	6-30-65	1.30	2.01
*2744.99	Keaahala Stream at Kamehameha Highway, at Kaneohe	Lat 21°25'12", long 157°48'15", 36 ft above bridge on Kamehameha Highway in Kaneohe.	.59	1961-63, 1965	6-30-65	2.98	4.61
*2825	Ahuimanu Stream near Kahaluu	Lat 21°27'04", long 157°50'13", at bridge site on Ahuimanu Road and 0.8 mile south of Kahaluu.	2.25	1962-63, 1965	6-30-65	2.29	3.54
2845	Waihee Stream above Kahaluu Stream, near Kahaluu	Lat 21°27'31", long 157°50'26", 300 ft above confluence with Kahaluu Stream and 0.1 mile southwest of Kahaluu.	2.24	1961-63, 1965	6-30-65	9.50	14.7
2931	Waianu Stream at Waiahole	Lat 21°28'59", long 157°51'49", 0.6 mile southwest of Waiahole School and 2.3 miles northwest of Kahaluu.	1.65	1961-63, 1965	6-30-65	1.50	2.32
		Island of Maui					
5320	Haipuaena Stream at Haiku-uka boundary, near Kailiili	Lat 20°49'26", long 156°12'30", 340 ft below Haiku-uka trail and 4.5 miles southeast of Kailiili.	.61	1919-27≠, 1933-34≠, 1963-65	8-26-64 11-22-64 1-12-65	.50 1.22 .24	.77 1.89 .37
5420	East Branch Puohokamoa Stream at Haiku-uka boundary, near Kailiili	Lat 20°49'36", long 156°12'39", 200 ft below Haiku-uka trail and 4.3 miles east of Kailiili.	.14	1920-27≠, 1933≠, 1963-65	7- 7-64 8-26-64 11-22-64 1-12-65 4-22-65 6- 2-65	.27 .20 .41 .13 .13 .42	.42 .31 .64 .20 .20 .65
5440	West Branch Puohokamoa Stream at Haiku-uka boundary, near Kailiili	Lat 20°49'51", long 156°13'03", 150 ft below Haiku-uka trail and 3.8 miles southeast of Kailiili.	.50	1919-28≠, 1933-35≠, 1963-65	7- 7-64 8-26-64 10- 7-64 11-22-64 1-12-65 4-22-65 6- 2-65	.38 .21 5.39 1.37 .09 .22 1.42	.59 .32 8.34 2.12 .14 .34 2.20
5540	Waikamoi Stream at Haiku-uka boundary, near Kailiili	Lat 20°49'55", long 156°13'23", at Haiku-uka trail and 3.4 miles east of Kailiili.	3.46	1918-28≠, 1933-35≠, 1963-65	8-27-64 10- 7-64 11-22-64 1-12-65 4-22-65 6- 3-65	.45 13.0 4.08 .70 1.11 4.32	.69 20.1 6.31 1.08 1.71 6.69

* Also a crest-stage partial-record station.
≠ Operated as a continuous-record gaging station.
a Revised.

Discharge measurements made at low-flow partial-record stations during fiscal year 1965--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements		
					Date	Discharge	
						Mgd	Cfs
		Island of Maui--Continued					
5545	East Branch Waikamoi Stream at Haiku-uka boundary, near Kailiili	Lat 20°49'53", long 156°13'21", 150 ft above Haiku-uka trail and 3.4 miles southeast of Kailiili.	0.07	1918-28≠, 1933≠, 1963-65	7- 7-64	0.24	0.37
					8-26-64	.18	.28
					10- 7-64	3.53	5.46
					11-22-64	.92	1.42
					1-12-65	.07	.11
					4-22-65	.42	.65
					6- 4-65	.98	1.52
5691	Nailiilihaele Stream near Kailiili	Lat 20°50'27", long 156°13'38", 0.6 mile below Haiku-uka trail and 3.0 miles east of Kailiili.	.11	1963-65	7- 8-64	.05	.07
					10- 8-64	.06	.09
					11-23-64	.03	.05
					4-23-65	.01	.02
					6-13-65	.08	.13
5762	East Branch Kailua Stream near Kailiili	Lat 20°50'25", long 156°14'07", 0.4 mile below Haiku-uka trail and 2.5 miles east of Kailiili.	.35	1963-65	7- 6-64	.52	.80
					8-25-64	.27	.41
					10- 8-64	.59	.91
					11-23-64	.72	1.12
					1-13-65	.15	.23
					4-23-65	.25	.38
					6- 3-65	1.82	2.82
		Island of Guam, Mariana Islands					
8073	Fonte River at dam, near Nimitz Hill	Lat 13°27'25" N., long 144°43'34" E., at old diversion dam, 0.4 mile south of Force Headquarters building on Nimitz Hill, and 1.2 miles southeast of Asan.	.60	1961-65	3-23-65		.45
					4-28-65		.25
					6-10-65		.28
8075	Asan Spring at Asan	Lat 13°28'11" N., long 144°43'04" E., on hillside 200 ft above upper street in Asan, 0.2 mile southeast of Marine Drive, and 0.8 mile southwest of Coontz Junction.	-	1962, 1964-65	3-23-65		.32
8077	Masso River at dam, near Piti	Lat 13°27'21" N., long 144°41'43" E., at end of penstocks on downstream side of dam, 0.5 mile southeast of Schroeder Junction, and 0.7 mile south of approximate center of Piti.	.74	1962, 1964-65	3-23-65		.40
					4-28-65		.14
					6-10-65		.13
8080	Santa Rita Spring at Santa Rita	Lat 13°23'04" N., long 144°40'23" E., 0.1 mile southeast of Santa Rita Catholic Church and 1.1 miles southeast of junction of Santa Rita Road and Marine Drive.	-	1962, 1964-65	3-23-65		.04
8082	Faata Spring near Agat	Lat 13°22'25" N., long 144°39'58" E., 0.4 mile southwest of Alifan Mountain and 1.0 mile southeast of Agat.	-	1963-65	3-23-65		.22
					4-28-65		.33
8085	Taleyfac River near Agat	Lat 13°21'40" N., long 144°39'00" E., 800 ft above bridge on Agat-Umatac Road and 1.7 miles southwest of Agat School.	1.77	1960-65	3-23-65		1.38
					4-28-65		.41
					6-10-65		.39
8092	Right Branch Cetti River near Umatac	Lat 13°18'58" N., long 144°39'21" E., at confluence with Left Branch, 50 ft upstream from gaging station on Cetti River, and 1.3 miles northwest of Umatac School.	.37	1961-62, 1964-65	4-12-65		.23
8100	Right Branch Umatac River at Umatac	Lat 13°17'50" N., long 144°39'50" E., 50 ft above confluence with Left Branch and 0.3 mile southeast of Umatac Catholic Church.	.95	1960-65	3-24-65		.69
					4-27-65		.49
					6- 8-65		.50
8120	Left Fork of Left Branch Umatac River near Umatac	Lat 13°17'25" N., long 144°39'50" E., 0.4 mile above confluence with Right Fork and 1.2 miles southeast of Umatac Catholic Church.	.35	1960-65	3-24-65		.16
					4-27-65		.14
					6- 8-65		.09
8130	Piga Spring near Umatac	Lat 13°17'55" N., long 144°40'47" E., at the source of the Right Fork of Left Branch Umatac River and 1.4 miles due east of Umatac Catholic Church.	-	1955, 1961-65	3-31-64		.16
					3-24-65		.13
					4-27-65		.13
					6- 8-65		.14
8140	Right Fork of Left Branch Umatac River at Umatac	Lat 13°17'40" N., long 144°40'20" E., 50 ft above confluence with Left Fork and 0.9 mile southeast of Umatac Catholic Church.	.36	1960-65	3-24-65		.17
					4-27-65		.04
					6- 8-65		.07

≠ Operated as a continuous-record gaging station.

Discharge measurements made at low-flow partial-record stations during fiscal year 1965--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements		
					Date	Discharge	
						Mgd	Cfs
		Island of Guam, Mariana Islands--Continued					
8170	Toguan River near Umatac	Lat 13°17'05" N., long 144°39'35" E., at highway bridge on Route 4 and 1.0 mile south of Umatac Catholic Church.	0.48	1952, 1960-65	3-24-65 4-29-65 6- 8-65		0.15 .08 .07
8200	Geus River above Siligin Spring tributary, near Merizo	Lat 13°16'45" N., long 144°49'55" E., above pipeline diversion to village of Merizo and 2.0 miles northeast of Merizo School.	.50	1960-65	3-24-65 4-29-65 6- 8-65		.12 .08 .12
8205	Siligin Spring near Merizo	Lat 13°16'44" N., long 144°40'55" E., 0.2 mile above Geus River diversion dam and 1.6 miles northeast of Merizo School.	-	1954, 1961-65	3-31-64 4-29-65 6- 8-65		.04 .04 .04
8207	Geus River below Siligin Spring tributary, near Merizo	Lat 13°16'41" N., long 144°40'55" E., 1.6 miles northeast of Merizo School and 2.0 miles southeast of Umatac School.	.60	1962-65	3-24-65 4-29-65 6- 8-65		.54 .30 .28
8250	Ajayan River near Inarajan	Lat 13°15'16" N., long 144°42'56" E., 2.4 miles southwest of Inarajan School and 3.8 miles southeast of Merizo School.	1.08	1962-65	3-25-65 4-29-65 6 -9-65		.16 .11 .11
8280	Agfayan River near Inarajan	Lat 13°16'03" N., long 144°43'42" E., 1.2 miles southwest of Inarajan School and 4.5 miles east of Merizo School.	1.67	1962-65	3-25-65 4-29-65 6- 9-65		.25 .13 .18
8300	Right Fork of Right Branch Inarajan River near Inarajan	Lat 13°17'00" N., long 144°43'25" E., above confluence with Left Fork and 1.6 miles northwest of Inarajan Catholic Church.	1.40	1960-65	3-25-65 4-30-65 6- 9-65		1.23 .72 .84
8310	Left Fork of Right Branch Inarajan River near Inarajan	Lat 13°17'00" N., long 144°43'25" E., above confluence with Right Fork and 1.6 miles northwest of Inarajan Catholic Church.	.97	1960-65	3-25-65 4-30-65 6- 9-65		.90 .91 .99
8330	Right Fork of Left Branch Inarajan River near Inarajan	Lat 13°17'25" N., long 144°43'45" E., 1.6 miles northwest of Inarajan Catholic Church and 4.9 miles southwest of Talofofo School.	.84	1960-65	3-25-65 4-30-65 6- 9-65		.97 .61 .40
8340	Left Fork of Left Branch Inarajan River near Inarajan	Lat 13°17'10" N., long 144°44'10" E., above confluence with Right Fork and 1.0 mile northwest of Inarajan Catholic Church.	.39	1960-65	3-25-65 4-30-65 6- 9-65		.21 .11 .11
8420	Asalonso River near Talofofo	Lat 13°19'41" N., long 144°45'34" E., 300 ft below highway bridge on Route 4 and 1.8 miles south of Talofofo School.	1.50	1952, 1961-65	3-31-65 4-30-65 6-16-65		.40 .32 .46
8450	Tolaeyuus River near Agat	Lat 13°21'55" N., long 144°42'40" E., 3.7 miles southeast of Agat and 4.8 miles southwest of Yona.	6.5	1952-61≠, 1962-65	4- 5-65 5- 4-65		2.77 1.80
8460	Tolaeyuus River at mouth, near Agat	Lat 13°21'30" N., long 144°42'30" E., above confluence with Fena River, about 0.4 mile east of Fena Dam spillway, and 4.0 miles southeast of Agat School.	7.42	1962-65	4- 5-65 5- 4-65		3.46 2.87
8540	Left Branch Ugum River near Talofofo	Lat 13°19'10" N., long 144°43'45" E., 50 ft above confluence with Right Branch and 2.9 miles southwest of Talofofo School.	2.96	1961-65	3-31-65 4-30-65 6-16-65		4.04 3.90 4.55
8545	Right Branch Ugum River near Talofofo	Lat 13°19'10" N., long 144°43'45" E., at confluence with Left Branch and 2.9 miles southwest of Talofofo School.	2.70	1961-65	3-31-65 4-30-65 6-16-65		3.41 3.12 2.68
8590	Left Branch Ylig River above pumping station, near Yona	Lat 13°24'05" N., long 144°45'05" E., 0.3 mile above Ylig River and 1.7 miles southwest of Yona Catholic Church.	1.98	1960-62, 1964-65	3-31-65 4-30-65 6-16-65		1.39 .71 1.11
8670	Janum Spring near Yigo	Lat 13°30'56" N., long 144°54'49" E., in small cave at sea level in limestone cliff on edge of reef, 2.2 miles southeast of Yigo.	-	1954-56, 1958, 1960-62, 1965	8- 7-64 6-24-65		6.80 3.22
8680	Santa Rosa Spring near Yigo	Lat 13°31'49" N., long 144°54'43" E., 0.3 mile south of radar station at Mt. Santa Rosa and 1.4 miles east of Yigo.	-	1962, 1964-65	3-23-65 5- 3-65 6-24-65		.01 0 0

≠ Operated as a continuous-record gaging station.

Discharge measurements made at low-flow partial-record stations during fiscal year 1965--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements		
					Date	Discharge	
						Mgd	Cfs
		Island of Guam, Mariana Islands--Continued					
8690	Chunge Spring near Yigo	Lat 13°32'07" N., long 144°54'52" E., about 300 ft northeast of intersection of Mt. Santa Rosa Road and access road to FAA radar station and 1.6 miles east of Yigo School.	-	1962, 1964-65	3-23-65 5- 3-65 6-24-65		0 0 0
		Island of Okinawa, Ryukyu Islands					
8757	Hiji-gawa at Hiji	Lat 26°43'12" N., long 128°10'40" E., at Hiji, 0.4 mile above Taihoza-gawa, and 1.1 miles east of Hama.	3.3	1964-65	7-30-64 9-14-64 10-28-64		10.2 4.40 3.55
8758	Tihoza-gawa at Hiji	Lat 26°43'21" N., long 128°10'55" E., 0.2 mile east of Hiji, 0.6 mile above mouth, and 1.4 miles northeast of Hama.	2.3	1964-65	7-30-64 10-28-64		11.4 3.81
8765	Taiho-okawa at Taiho	Lat 26°39'01" N., long 128°08'37" E., 1.0 mile east of Taiho and 1.7 miles north of Taira.	5.2	1964-65	1- 4-65 1-25-65 2-18-65 2-26-65 3-12-65		38.1 5.04 4.91 6.06 5.16
8772	North Fork Henan-gawa at Tsuha	Lat 26°38'28" N., long 128°05'47" E., 0.4 mile above confluence with South Fork and 0.8 mile south of Tsuha.	1.4	1964-65	7-14-64 3-10-65		2.38 2.40
8780	Makiya-okawa at Makiya	Lat 26°37'10" N., long 128°02'18" E., 0.3 mile south of Makiya, 0.5 mile east of Nakaoshi, and 0.6 mile above mouth.	1.7	1964-65	10-16-64 11-19-64		6.04 1.09
8790	Manna-gawa at Manna	Lat 26°39'12" N., long 127°55'06" E., at Manna, 0.5 mile east of Inoba-shogakko (elementary school) and 1.4 miles above highway bridge at mouth.	2.2	1964-65	11- 2-64 11-13-64 12- 2-64 2- 4-65		1.82 1.42 .98 .94
8794	Yofuke-gawa at Yofuke	Lat 26°34'02" N., long 127°59'43" E., 0.6 mile southeast of Yofuke and 0.6 mile northeast of Sukuta.	1.2	1964-65	11-20-64 4- 9-65		.84 1.02
8795	Sukuta-kawa at Sukuta	Lat 26°33'33" N., long 127°59'23" E., 0.4 mile southeast of Sukuta, 0.6 mile above mouth, and 0.8 mile south of Yofuke.	1.1	1964-65	11-20-64 4- 9-65		.55 .57
8796	Fukuchi-gawa at Kyoda	Lat 26°32'37" N., long 127°58'40" E., 0.7 mile northeast of Kyoda and 1.5 miles southwest of Sukuta.	1.1	1964-65	11-20-64 4- 9-65		.59 .58
8832	O-kawa at Kushi	Lat 26°30'50" N., long 127°59'50" E., 0.7 mile north of junction of Highways 13 and 108 and 0.7 mile west of Kushi.	1.3	1964-65	11-18-64 11-26-64		.79 .70
8835	Suginda-gawa at Suginda	Lat 26°32'41" N., long 128°01'56" E., 0.1 mile west of Suginda and 0.4 mile south of Futami.	.9	1964-65	11-18-64 11-26-64		.71 .40
8836	Oura-gawa at Oura	Lat 26°33'32" N., long 128°02'35" E., 0.5 mile north of Oura and 1.0 mile northwest of Sedake.	3.1	1964-65	11-18-64 11-26-64		2.30 2.09
8838	Teema-gawa at Mihara	Lat 26°33'11" N., long 128°04'48" E., below Mihara-gawa, 0.1 mile southeast of Mihara-sho-chugakko (school), and 0.9 mile east of Teema.	3.2	1964-65	11-18-64 11-26-64		3.22 3.48
		Island of Tutuila, Samoa Islands					
9000	Vailoa Stream at Tula	(a) Lat 14°15'33" S., long 170°34'20" W., 0.5 mile west of Tula and 0.6 mile above mouth.	.06	1959-65	6-15-65	0.20	.31
9025	Vaisa Stream at Onenoa	(a) Lat 14°15'27" S., long 170°34'44" W., 30 ft below unnamed tributary, 0.1 mile southeast of Onenoa, and 0.1 mile above mouth.	.12	1964-65	6-15-65	.32	.50

a Revised.

Discharge measurements made at low-flow partial-record stations during fiscal year 1965--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements		
					Date	Discharge	
						Mgd	Cfs
		Island of Tutuila, Samoa Islands--Continued					
9030	Afimuao Stream at Onenoa	(a) Lat 14°15'34" S., long 170°34'53" W., 200 ft below unnamed tributary, 0.2 mile southwest of Onenoa, and 0.2 mile above mouth.	(a) 0.06	1959-65	6-15-65	0.28	0.43
9040	Laoulu Stream at Aoa	Lat 14°15'54" S., long 170°34'50" W., 0.2 mile east of Aoa and 0.2 mile above mouth.	(a) .05	1959-65	6-16-65	.07	.11
9050	Lepa Stream at Aoa	(a) Lat 14°16'21" S., long 170°35'17" W., 0.5 mile above mouth and 0.6 mile southwest of Aoa.	(a) .09	1959-65	6-16-65	.18	.28
9160	Leua Stream at Fagasa	(a) Lat 14°17'24" S., long 170°43'00" W., 0.2 mile northeast of Fagasa and 0.2 mile above mouth.	.14	1960-65	6-14-65	.74	1.14
9170	Leele Stream at Fagasa	(a) Lat 14°17'32" S., long 170°43'01" W., 0.1 mile southeast of Fagasa and 0.2 mile above mouth.	(a) .19	1960-65	6-14-65	1.31	2.03
9180	Lesina Stream at Fagasa	(a) Lat 14°17'37" S., long 170°43'14" W., 0.1 mile above mouth and 0.2 mile southwest of Fagasa.	(a) .02	1960-65	6-14-65	.16	.25
9198	Aasu Stream at Aoloaufou	Lat 14°18'54" S., long 170°46'00" W., 0.3 mile north of Aoloaufou and 1.3 miles southeast of Aoloautuai.	(a) .24	1960-65	6-18-65	.22	.34
9220	Vaisa Stream at Aoloautuai	(a) Lat 14°18'15" S., long 170°47'00" W., 200 ft below unnamed tributary, 0.3 mile above Vailolo Stream, and 0.3 mile southwest of Aoloautuai.	(a) .78	1960-63, 1965	6-15-65	.42	.65
9270	Puna Stream at Amanave	(a) Lat 14°19'39" S., long 170°49'48" W., 0.2 mile above Maululu Stream and 0.2 mile north of Amanave.	(a) .03	1959-65	6-16-65	.49	.76
9280	Afutele Stream at Agugulu	(a) Lat 14°20'05" S., long 170°49'06" W., 30 ft below unnamed tributary at Agugulu and 0.1 mile above mouth.	(a) .17	1959-65	6-15-65	.88	1.36
9290	Vaialae Stream at Utumea	(a) Lat 14°19'56" S., long 170°48'50" W., 0.1 mile north of Utumea and 0.1 mile above mouth.	(a) .15	1959-65	6-15-65	.64	.99
9320	Asili Stream near Asili	(a) Lat 14°19'46" S., long 170°47'42" W., 0.4 mile north of Asili and 0.5 mile above mouth.	(a) .55	1960-65	6-16-65	3.88	6.00
9325	Asili Stream at Asili	(a) Lat 14°20'04" S., long 170°47'40" W., 0.1 mile north of Asili and 0.1 mile above mouth.	(a) .66	1958-59≠, 1960-65	6-16-65	4.44	6.87
9330	Vaipuna Stream at Amaluia	(a) Lat 14°19'48" S., long 170°47'20" W., 300 ft above unnamed tributary, 0.6 mile north of Amaluia, and 0.7 mile above mouth.	(a) .08	1960-65	6-16-65	.44	.68
9350	Fuafua Stream at Malaeloa	(a) Lat 14°19'58" S., long 170°46'12" W., 40 ft below unnamed tributary, 0.8 mile north of Malaeloa, and 2.1 miles above mouth.	(a) .29	1960-65	6-17-65	1.84	2.85
9355	Sigaloa Stream at Malaeloa	(a) Lat 14°20'27" S., long 170°45'53" W., 0.1 mile above mouth and 0.3 mile northeast of Malaeloa.	(a) .01	1960-65	6-17-65	.06	.09
9360	Leaveave Stream at Mapusagafou	(a) Lat 14°19'12" S., long 170°45'00" W., 0.1 mile above Puna Stream and 0.7 mile north of Mapusagafou.	(a) .15	1960-65	6-18-65	.40	.62
9370 (formerly 9400)	(a) Vaitele Stream at Lepine	(a) Lat 14°18'51" S., long 170°43'35" W., 0.7 mile north of Lepine and 1.1 miles above mouth.	(a) .18	1959-65	6-23-65	1.78	2.75
9380 (formerly 9410)	(a) Vaitele Stream tributary at Lepine	(a) Lat 14°18'57" S., long 170°43'21" W., 0.2 mile above mouth and 0.7 mile northeast of Lepine.	(a) .09	1959-65	6-23-65	.53	.82

≠ Operated as a continuous-record gaging station.
a Revised.

Discharge measurements made at low-flow partial-record stations during fiscal year 1965--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements		
					Date	Discharge	
						Mgd	Cfs
		Island of Tutuila, Samoa Islands--Continued					
9390	(a) Taumata Stream near Mapusaga	(a) Lat 14°18'23" S., long 170°44'00" W., 100 ft above unnamed tributary, 1.6 miles north of Mapusaga, and 2.2 miles above mouth.	(a) 0.02	1960-65	6-18-65	0.35	0.54
9400 (formerly 9380)	(a) Taumata Stream tributary near Mapusaga	(a) Lat 14°18'27" S., long 170°43'49" W., 0.5 mile above mouth and 1.6 miles northeast of Mapusaga.	(a) .04	1960-65	6-18-65	.16	.25
9410 (formerly 9370)	(a) Mapusagatuai Stream at Mapusaga	(a) Lat 14°19'38" S., long 170°44'48" W., 0.3 mile west of Mapusaga and 1.2 miles above mouth.	.08	1960-65	6-17-65	.36	.56
9420	Sauino Stream near Nuuuli	(a) Lat 14°18'53" S., long 170°43'03" W., 0.6 mile above mouth and 1.3 miles west of Nuuuli.	(a) .09	1960-65	6-24-65	.37	.57
9430	Mataalii Stream near Nuuuli	(a) Lat 14°18'42" S., long 170°42'51" W., 0.6 mile above mouth and 1.1 miles northwest of Nuuuli.	(a) .14	1960-65	6-24-65	.74	1.14
9460	Avau Stream at Faganeanea	(a) Lat 14°18'34" S., long 170°41'35" W., 0.2 mile above mouth and 0.4 mile southwest of Faganeanea.	(a) .09	1960-65	6-16-65	.34	.53
9470	Afu Stream at Faganeanea	(a) Lat 14°18'16" S., long 170°41'25" W., 0.2 mile northwest of Faganeanea and 0.3 mile above mouth.	(a) .22	1959-65	6-14-65	1.06	1.64
9497 (formerly 9510)	Vaima Stream at Pago Pago	(a) Lat 14°17'30" S., long 170°42'29" W., 0.4 mile above mouth and 1.0 mile southwest of Pago Pago.	(a) .05	1960-65	6-14-65	.45	.70
9498	Utumoa Stream near Pago Pago	(a) Lat 14°17'35" S., long 170°42'20" W., 0.6 mile above mouth and 1.1 miles south of Pago Pago.	(a) .07	1961-65	6-14-65	.54	.84
9505	Utumoa Stream at Pago Pago	(a) Lat 14°17'21" S., long 170°42'21" W., 0.3 mile above mouth and 0.8 mile south of Pago Pago.	(a) .17	1957-58≠, 1961-65	6-14-65	.79	1.22
9525 (formerly 9535)	Lalolamauta Stream at Aua	(a) Lat 14°16'25" S., long 170°39'31" W., 300 ft above Amano Stream and 0.4 mile east of Aua.	(a) .14	1959-65	6-14-65	1.23	1.90
9530	(a) Matagimalie Stream at Aua	(a) Lat 14°16'19" S., long 170°39'50" W., 0.2 mile north of Aua and 0.2 mile above mouth.	(a) .03	1959-65	6-14-65	.22	.34
9550	Anasosopo Stream at Anasosopo	(a) Lat 14°17'14" S., long 170°39'44" W., 400 ft above highway bridge at Anasosopo and 0.1 mile above mouth.	.05	1960-65	6-14-65	.33	.51
9555	Vaisina Stream at Lauliifou	(a) Lat 14°17'34" S., long 170°39'25" W., 0.1 mile north of Lauliifou and 600 ft above highway bridge.	(a) .06	1960-65	6-17-65	.10	.16
9560	Vaitele Stream at Lauliituai	(a) Lat 14°17'05" S., long 170°39'07" W., 200 ft above unnamed tributary, 0.5 mile north of Lauliituai, and 0.7 mile above mouth.	(a) .19	1960-65	6-17-65	1.04	1.61
9565	Maga Stream at Lauliituai	(a) Lat 14°17'12" S., long 170°39'09" W., 0.1 mile above mouth and 0.4 mile north of Lauliituai.	(a) .05	1960-65	6-17-65	.06	.09
9570	Lesea Stream at Lauliituai	Lat 14°17'19" S., long 170°39'00" W., 0.1 mile above mouth and 0.3 mile northeast of Lauliituai.	(a) .02	1960-65	6-17-65	.65	1.01
9580	(a) Visa Stream at Alega	(a) Lat 14°17'21" S., long 170°38'37" W., 0.2 mile above mouth and 0.5 mile southwest of Alega.	(a) .10	1959-65	6-14-65	.50	.77
9585	(a) Visa Stream tributary at Aumi	(a) Lat 14°17'24" S., long 170°38'35" W., 200 ft above mouth and 0.3 mile northeast of Aumi.	.02	1959-65	6-14-65	.11	.17

≠ Operated as a continuous-record gaging station.
a Revised.

Discharge measurements made at low-flow partial-record stations during fiscal year 1965--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements		
					Date	Discharge	
						Mgd	Cfs
		Island of Tutuila, Samoa Islands--Continued					
9605	(a) Alega Stream tributary at Alega	Lat 14°16'57" S., long 170°38'16" W., 300 ft above mouth and 0.2 mile north of Alega.	(a) 0.04	1962-65	6-17-65	0.38	0.59
9610	Muliolevai Stream at Auto	(a) Lat 14°16'37" S., long 170°37'54" W., 400 ft below unnamed tributary, 0.5 mile northwest of Auto, and 0.5 mile above mouth.	(a) .22	1959-65	6-17-65	1.08	1.67
9620	Ialoi Stream at Amouli	(a) Lat 14°16'43" S., long 170°35'16" W., 0.2 mile above Fusiloa Stream and 0.3 mile west of Amouli.	(a) .09	1959-65	6-16-65	.35	.54
9630	Televai Stream at Amouli	(a) Lat 14°16'25" S., long 170°34'55" W., 50 ft below unnamed tributary, 0.1 mile above Tuavaa Stream, and 0.3 mile north of Amouli.	.10	1959-65	6-16-65	.27	.42
9640	Leafu Stream at Auasi	Lat 14°16'28" S., long 170°34'26" W., 0.1 mile north of Auasi and 0.2 mile above mouth.	(a) .12	1959-65	6-16-65	.30	.46
9650	Vaialili Stream at Alao	(a) Lat 14°16'15" S., long 170°34'08" W., 0.2 mile above Vaifusi Stream and 0.5 mile southwest of Alao.	(a) .10	1959-65	6-15-65	.25	.39
9660	Vaifusi Stream at Alao	(a) Lat 14°16'08" S., long 170°34'05" W., 400 ft above mouth and 0.3 mile west of Alao.	.02	1959-65	6-15-65	.03	.05

a Revised.

Crest-stage partial-record stations

Crest-stage partial-record stations for the State of Hawaii are published in an annual progress report entitled "An Investigation of Floods in Hawaii." The following table contains annual maximum discharges for crest-stage stations not included in that report. A crest-stage gage is a device which will register the peak stage occurring between inspections of the gage. A stage-discharge relation for each gage is developed from discharge measurements made by indirect measurements of peak flow or by current meter. The date of the maximum discharge is not always certain but is usually determined by comparison with nearby continuous-record stations, weather records, or local inquiry. Only the maximum discharge for each fiscal year is given. Information on some lower floods may have been obtained but is not published herein. The years given in the period of record represent fiscal years for which the annual maximum has been determined.

Annual maximum discharge at crest-stage partial-record stations

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Discharge (cfs)
		Island of Okinawa, Ryukyu Islands					
8808	Hiya-gawa at Ojana	Lat 26°15'35" N., long 127°44'08" E., 0.1 mile south of Ojana and 0.6 mile above mouth.	2.2	1964-65	6-15-65	3.2	(/)
8812	Kanegusuku-gawa at Kanegusuku	Lat 26°11'31" N., long 127°43'36" E., 0.2 mile northwest of Kanegusuku and 1.3 miles east of Kokubu.	3.0	1964-65	6-15-65	8.7	(/)
8815	Mukue-gawa near Itomancho	Lat 26°07'58" N., long 127°41'22" E., at highway bridge, 0.6 mile west of Yoza, and 0.9 mile northeast of Itomancho.	6.4	1964-65	6-15-65	9.0	(/)

/ Not determined.

Measurements at miscellaneous sites

Measurements of streamflow at points other than gaging stations or partial-record stations are given in the following table.

Discharge measurements made at miscellaneous sites during fiscal year 1965

Stream	Tributary to	Location	Measured previously (fiscal years)	Measurements		
				Date	Discharge	
					Mgd	Cfs
Island of Kauai						
Kawaikoi Stream tributary	Kawaikoi Stream	Lat 22°08'05", long 159°37'29", at mouth, 100 ft below Kawaikoi Stream gaging station, and 12.5 miles north of Waimea.	1963	5-25-65	0.67	1.03
Island of Oahu						
Makiki ditch	Pacific Ocean	Lat 21°17'40", long 157°50'15", 1,500 ft south of Washington School and 2 miles southeast of Honolulu Post Office.		3-25-65	.24	.37
Manoa Stream	Pacific Ocean	Lat 21°17'38", long 157°49'03", 0.5 mile west of St. Louis College and 3.1 miles southeast of Honolulu Post Office.	1964	3-25-65	5.03	7.78
Unnamed Stream	Pacific Ocean	Lat 21°25'08", long 157°46'03", at Kaneohe Bay Drive 0.1 mile east of Kaneohe Yacht Club, 1.1 miles west of Kainalu School, and 4.1 miles southwest of Makapu Point.		5- 2-65	/110	/170
Unnamed Stream	Pacific Ocean	Lat 21°24'48", long 157°46'53", at Kokokahi YWCA camp in Kokokahi on Kaneohe Bay Drive and 1.0 mile east of Castle High School.		5- 2-65	/189	/292
Kawa Stream tributary	Kawa Stream	Lat 21°24'12", long 157°47'25", at Mokulele Drive, 0.4 mile southeast of Castle High School, and 0.8 mile east of junction of Kamehameha Highway and Kaneohe Bay Drive.		5- 2-65	/582	/900
Haiku Stream	Pacific Ocean	Lat 21°25'15", long 157°49'02", at new Kahaluu cut-off highway, 700 ft downstream from Iolekaa Stream, and 0.8 mile southwest of Heeia.		5- 2-65	/3,620	/5,600
Kahaluu Stream	Pacific Ocean	Lat 21°26'33", long 157°50'45", at point opposite cul-de-sac on Nenehiwa Place, 0.6 mile east of Ahuimanu Ranch, and 1.4 miles southwest of Kahaluu.		5- 2-65	/2,890	/4,470
Waihee Stream tributary	Waihee Stream	Lat 21°27'22", long 157°50'15", 60 ft below bridge on Ahilama Road, 0.7 mile southwest of Kahaluu, and 1.0 mile northwest of Ahuimanu Ranch.		5- 2-65	/1,530	/2,370
Kaalaea Stream	Pacific Ocean	Lat 21°28'19", long 157°51'21", 1.0 mile south of Waiahole School and 1.4 miles northwest of Kahaluu.		5- 2-65	/2,040	/3,160
Island of Maui						
Kalialinui Gulch tributary	Kalialinui Gulch	Lat 20°49'02", long 156°19'44", at Highway 37, 1.1 miles south of north junction of Highways 37 and 377, and 2.8 miles west of Olinda Prison Camp.		7-23-64	/520	/805
Kaluapulani Gulch	Kalialinui Gulch	Lat 20°48'35", long 156°18'35", at Highway 377, 1.5 miles west of Olinda Prison Camp, and 2.2 miles southeast of north junction of Highways 37 and 377.		7-23-64	/177	/274
Kaluapulani Gulch tributary No. 2	Kaluapulani Gulch	Lat 20°49'04", long 156°18'32", at Highway 377, 1.6 miles northwest of Olinda Prison Camp, and 1.6 miles southeast of north junction of Highways 37 and 377.		7-23-64	/182	/282
Kalialinui Gulch	Pacific Ocean	Lat 20°52'50", long 156°26'06", 370 ft above bridge on Hanson Road, 0.2 mile southwest of junction of Hanson Road and Haleakala Highway, and 0.5 mile northeast of Puunene Hospital.		7-23-64	/189	/292
Waiehu Stream	Pacific Ocean	Lat 20°55'17", long 156°29'53", between Kahikili Highway and Waiehu Beach Road, 0.2 mile above mouth, and 2.1 miles north of Wailuku Post Office.		2- 4-65	/1,140	/1,760

/ Peak flow.

Discharge measurements made at miscellaneous sites during fiscal year 1965--Continued

Stream	Tributary to	Location	Measured previously (fiscal years)	Measurements		
				Date	Discharge	
					Mgd	Cfs
		Island of Hawaii				
Wailuku River	Pacific Ocean	Lat 19°43'13", long 155°16'13", at altitude 3,540 ft, 6.4 miles southeast of Pua Akala.		7-14-64	0.60	0.93
Wailuku River	Pacific Ocean	Lat 19°43'08", long 155°15'20", at altitude 3,250 ft, 7 miles southeast of Pua Akala.		7-14-64	.64	.99
Wailuku River tributary	Wailuku River	Lat 19°42'37", long 155°16'22", at altitude 3,620 ft, 6.6 miles southeast of Pua Akala.		7-13-64	.29	.45
West Branch Honokane Iki Stream	Honokane Iki Stream	Lat 20°09'47", long 155°43'25", 2.3 miles above mouth and 4.4 miles southeast of Niulii cemetery.	1961-64	7- 8-64	.12	.19
				8-19-64	.26	.40
				10- 7-64	1.42	2.19
				11-19-64	2.42	3.74
				1-13-65	.07	.10
				3- 4-65	2.07	3.22
				4-21-65	.06	.09
				6-16-65	.06	.09
East Branch Honokane Nui Stream	Honokane Nui Stream	Lat 20°08'58", long 155°43'59", 3.6 miles above mouth and 5.2 miles south of Niulii cemetery.	1964	7- 7-64	2.05	3.18
				8-19-64	2.14	3.32
				10- 6-64	7.80	12.1
				11-17-64	2.73	4.22
				1-13-65	.16	.25
				3- 2-65	10.2	15.8
				4-20-65	15.3	23.7
				6-15-65	.98	1.51
Kawaa Springs	Pacific Ocean	Lat 19°06'50", long 155°31'47", at altitude 5 ft and 5 miles northeast of Naalehu.	1964	8- 7-64	8.60	13.3
				2-17-65	11.1	17.2
				3-17-65	7.56	11.7
				4-14-65	8.30	12.8
				6- 2-65	6.22	9.62
Ninole Springs	Pacific Ocean	Lat 19°07'57", long 155°30'54", 1.1 miles southwest of Punaluu and 3.6 miles northeast of Honuapo.	1964	8- 7-64	23.7	36.7
				2-17-65	23.5	36.4
				3-17-65	23.4	36.2
				4-14-65	21.0	32.5
				6- 2-65	19.4	30.0
		Island of Okinawa, Ryukyu Islands				
Nagata-gawa	Hiza-gawa	Lat 26°22'26" N., long 127°45'53" E., 0.9 mile above mouth and 1.0 mile northeast of Kadena traffic circle.		9-17-64		2.40
				9-25-64		1.90
				10-15-64		3.79
				10-20-64		2.45
				10-24-64		3.08
				10-31-64		1.84
				11- 7-64		1.81
				11-14-64		1.32
				11-28-64		1.22
				12- 2-64		1.49
				12- 5-64		1.95
				12-12-64		1.94
				12-19-64		3.80
				12-26-64		1.91
				12-31-64		3.22
				1-16-65		1.82
				1-20-65		1.77
				2- 6-65		2.22
				2-20-65		12.5
				4- 8-65		1.77

United States Department of the Interior
Geological Survey-Water Resources Division

WATER RESOURCES DATA FOR HAWAII AND OTHER PACIFIC AREAS

1965

Part 2. Water Quality Records

Prepared in cooperation with

Corps of Engineers, U.S. Army

Copies of this report may be obtained from
District Chief, Water Resources Division
U.S. Geological Survey
Room 330, First Insurance Bldg.
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Honolulu, Hawaii 96814

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WATER RESOURCES DATA FOR HAWAII AND OTHER PACIFIC AREAS, 1965

Part 2. Water Quality Records

INTRODUCTION

The water quality records for the period May 1964 to June 1965 for daily sampling stations and partial-record sites in Okinawa are given in this report. Some additional data are available in files of the district office. The data were collected and computed by the Water Resources Division of the U.S. Geological Survey, under the direction of Mearle M. Miller, district chief.

Distribution of this report is limited and it is primarily for local and immediate use. The records will be published in the Geological Survey water-supply papers at 5-year intervals.

COOPERATION

The work was done by the U.S. Geological Survey with assistance in the form of funds given by the Corps of Engineers, U.S. Army.

DEFINITION OF TERMS AND ABBREVIATIONS

A number of terms commonly used in relation to hydrologic data are defined in Part 1 of this report. Other terms related especially to water quality data are as follows:

Cubic feet per second (cfs) is a unit expressing rates of discharge. One cubic foot per second is equal to the discharge of a stream of rectangular cross section, 1 foot wide and 1 foot deep, flowing water at an average velocity of 1 foot per second.

Discharge in its simplest concept, means outflow; therefore, the use of this term is not restricted as to course or location, and it can be applied to describe the flow of water from a pipe or from a drainage basin. It is also correct to speak of the discharge of a canal or stream into a lake, a stream, or an ocean.

Daily mean discharge is the mean discharge for one day.

Mean daily discharge is the arithmetic mean discharge for the same day during a specific period of years.

Mean discharge is the arithmetic mean of individual daily mean discharges during a specific period.

Instantaneous discharge (at time of sampling). If the discharge value at the time of sampling is reported instead of daily mean value, the heading of the discharge column will be given as "Discharge (cfs)."

Drainage area is that area, in a specified location, measured in a horizontal plane, which is enclosed by a drainage divide.

Particle-size classification is the classification recommended by the American Geophysical Union Subcommittee on sediment terminology (Lane and others, 1947, p. 937). According to this classification, a particle having a diameter:

Less than 0.004 mm is clay.
Between 0.004 and 0.062 mm is silt.
Between 0.062 and 2.0 mm is sand.

Parts per million (ppm) is a unit for expressing the concentration of suspended sediment by weight, usually as grams of sediment per million grams of the mixture of water and sediment.

Sediment is solid material both mineral and organic that is transported by, suspended in, or deposited by water. The amount, characteristics and cause of the occurrence of sediment in streams are influenced by environmental factors. Some major factors are: degree of slope, length of slope, soil characteristics, land usage, and amount and intensity of precipitation.

Sediment discharge is the rate at which dry weight of sediment passes a section of a stream or is the quantity of sediment, as measured by dry weight, or by volume, that is discharged in a given time.

Suspended sediment is the sediment that at any given time is maintained in suspension by the upward components of turbulent currents or that exists in suspension as a colloid.

Tons per day is the quantity of substance in solution or suspension that passes a stream section during a 24-hour period.

COLLECTION AND EXAMINATION OF SAMPLES

The suspended-sediment samples usually are collected at points on streams where gaging stations are maintained by the U.S. Geological Survey for measurement of discharge. These discharge records are published in Part 1 of this report.

Temperature

Water temperatures were measured at most of the water-quality stations. For daily stations, the water temperatures were taken at about the same time each day in order that the data would be relatively unaffected by diurnal variations in temperature. The thermometers used for determining the water temperature were accurate to plus or minus 0.5°F.

Sediment

In general, suspended-sediment samples were collected daily with US DH-48 hand sampler during periods of low flow. For high or rapidly changing flow, samples were taken twice or more often throughout the day with U.S. depth-integrating cable-suspended samples. Samples were collected at three or more verticals to define the average concentration of sediment at the cross section.

For some periods when no samples were collected, daily loads of suspended sediment were estimated on the basis of water discharge, sediment concentrations observed immediately preceding and following the periods, and suspended-sediment loads for other periods of similar discharge. The estimates were further guided by weather conditions and sediment discharge for other stations.

In addition to the records of quantities of suspended sediment transported, records of periodic measurements of the particle size distribution of suspended sediment and bed material are included.

40-8755. YONA-GAWA AT YONA, OKINAWA

LOCATION.--At gaging station 0.9 mile southeast of Yona, and 2.7 miles east of Hentona School.
DRAINAGE AREA.--1.7 square miles, approximately.
RECORDS AVAILABLE.--Water temperatures: May 1964 to June 1965.
Sediment records: May 1964 to June 1965.
EXTREMES, 1964-65.--Water temperatures: Maximum, 83°F July 15, Aug. 10; minimum, 51°F Jan. 16.
Sediment concentrations: Maximum daily, 215 ppm June 23; minimum daily, 1 ppm on many days.
Sediment loads: Maximum daily, 435 tons June 23; minimum daily, less than 0.05 ton on many days.
EXTREMES, May 1964 to June 1965.--Water temperatures: Maximum, 83°F July 15, Aug. 10, 1964; minimum, 51°F Jan. 16, 1965.
Sediment concentrations: Maximum daily, 215 ppm June 23, 1965; minimum daily, 1 ppm on many days.
Sediment loads: Maximum daily, 435 tons June 23, 1965; minimum daily, less than 0.05 ton on many days.

Temperature (°F) of water, May to June 1964

Month	Day																														Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
May.....	69	69	70	70	72	71	71	69	--	70	70	65	65	67	66	67	68	70	69	69	69	70	71	74	73	71	71	70	70	70	70	70
June.....	70	70	67	67	66	66	70	70	67	71	73	74	72	73	70	69	70	69	71	72	76	74	72	71	77	76	75	72	78	75	--	71

Temperature (°F) of water, fiscal year July 1964 to June 1965

Month	Day																														Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
July.....	77	77	77	76	79	77	78	76	77	77	78	79	78	78	83	80	80	79	82	73	75	76	76	79	78	77	73	75	75	79	82	78
August.....	80	--	76	75	79	77	78	78	82	83	81	79	82	78	79	80	76	77	77	78	76	76	74	75	75	74	75	73	73	75	75	77
September....	77	76	81	77	76	81	76	77	77	76	75	71	76	82	77	79	77	76	78	82	76	77	77	76	79	76	77	75	74	75	--	77
October.....	74	76	73	75	78	78	79	75	73	70	70	71	73	74	74	74	79	73	74	73	74	74	73	73	73	71	73	73	68	69	69	73
November.....	70	70	69	71	71	70	68	69	69	69	66	66	64	61	64	62	62	62	66	62	--	--	66	64	61	60	59	60	65	64	--	65
December.....	64	63	61	60	58	59	60	61	63	--	64	63	63	60	61	63	64	59	58	60	59	59	60	63	60	59	63	63	60	60	61	61
January.....	60	58	59	59	58	58	--	56	53	54	53	52	52	52	52	51	53	53	56	56	56	55	56	58	57	55	57	56	56	58	56	56
February.....	58	57	52	54	55	57	57	60	61	62	61	59	58	60	57	57	61	61	60	62	61	60	59	58	57	55	55	57	--	--	--	58
March.....	57	61	60	60	57	57	61	58	56	55	56	56	62	59	55	55	53	57	58	60	58	59	60	61	60	60	59	60	60	60	60	58
April.....	61	61	59	61	63	61	59	60	--	65	60	62	64	60	59	67	64	65	64	60	65	64	65	66	69	70	67	65	68	65	--	63
May.....	62	66	65	64	63	63	67	66	66	68	66	67	67	69	68	68	67	65	66	70	68	67	67	68	69	70	65	66	67	68	68	67
June.....	70	71	69	73	68	69	69	--	--	69	71	70	70	70	70	70	70	71	74	73	70	73	73	70	73	73	73	73	78	78	--	71

40-8755. YONA-GAWA AT YONA, OKINAWA--Continued

Suspended sediment, May to June 1964

Day	APRIL			MAY			JUNE		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1..				2.1	2	T	45.4	4	0.5
2..				2.1	2	T	108	22	S 11
3..				2.1	2	T	39.9	3	.3
4..				2.1	2	T	21.8	2	.1
5..				2.2	2	T	18.5	2	.1
6..				5.7	8	.1	15.0	2	.1
7..				12.2	10	S .8	15.8	4	.2
8..				6.1	4	.1	54.2	15	S 3.6
9..				77.4	58	K 54	22.6	2	.1
10..				10.3	3	.1	16.4	2	.1
11..				21.0	6	.3	17.7	3	.1
12..				13.0	2	.1	15.0	2	.1
13..				7.4	1	T	14.3	2	.1
14..				5.8	1	T	15.7	4	.2
15..				5.0	1	T	145	171	K 260
16..				4.4	1	T	162	195	K 420
17..				4.2	1	T	62.7	7	1.2
18..				4.0	1	T	49.8	8	1.1
19..				38.0	22	S 4.2	39.0	3	.3
20..				15.5	2	.1	25.6	2	.1
21..				10.8	2	.1	20.1	2	.1
22..				8.1	2	T	85.6	106	S 144
23..				7.0	2	T	46.4	5	.6
24..				6.0	2	T	25.6	2	.1
25..				6.0	3	T	18.5	2	.1
26..				6.4	3	.1	15.7	1	T
27..				5.8	2	T	13.0	1	T
28..				11.2	4	.1	11.3	1	T
29..				7.4	3	.1	9.8	1	T
30..				78.9	16	S 6.6	8.9	1	T
31..				40.9	4	.4	--	--	
Total				429.1	--	67.5	1159.3	--	844.4

Total discharge for period (cfs-days)..... 1,588.4
Total load for period (tons)..... 911.9

S Computed by subdividing day.
T Less than 0.05 ton.
K Computed from estimated-concentration graph and subdividing day.

40-8755. YONA-GAWA AT YONA, OKINAWA--Continued

Suspended sediment, fiscal year July 1964 to June 1965

Day	JULY			AUGUST			SEPTEMBER		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1..	7.7	1	T	4.4	2	T	5.3	1	T
2..	7.4	1	T	4.2	2	T	5.0	1	T
3..	6.4	1	T	4.8	3	T	5.0	1	T
4..	6.4	1	T	4.7	2	T	4.4	1	T
5..	5.4	1	T	3.8	2	T	4.2	1	T
6..	5.4	1	T	3.8	1	T	4.0	1	T
7..	5.2	1	T	3.6	1	T	3.8	1	T
8..	5.0	1	T	3.6	1	T	3.6	1	T
9..	4.7	1	T	3.4	1	T	3.6	1	T
10..	4.8	1	T	3.4	1	T	16.4	63	S 12
11..	4.4	1	T	3.2	1	T	5.0	3	T
12..	4.2	1	T	3.4	1	T	3.8	2	T
13..	4.0	1	T	3.8	1	T	3.6	2	T
14..	3.8	1	T	3.0	1	T	3.4	1	T
15..	3.8	1	T	2.8	1	T	3.6	1	T
16..	4.0	1	T	3.2	2	T	3.4	1	T
17..	5.6	4	.1	29.1	13	S 1.8	3.4	1	T
18..	3.6	1	T	8.2	3	.1	3.2	1	T
19..	3.4	1	T	5.2	2	T	3.2	1	T
20..	19.3	14	S 1.5	4.7	2	T	3.2	1	T
21..	4.4	1	T	12.0	7	.2	3.2	1	T
22..	3.6	1	T	53.4	49	K 30	3.2	1	T
23..	3.6	1	T	29.9	5	.4	3.0	1	T
24..	3.4	1	T	13.2	2	.1	3.0	1	T
25..	4.4	3	T	10.0	2	.1	2.8	1	T
26..	5.3	5	.1	8.3	2	T	3.6	2	T
27..	53.7	16	S 3.2	7.2	1	T	4.2	3	T
28..	9.2	2	T	6.8	1	T	3.0	2	T
29..	6.4	2	T	6.2	1	T	10.2	9	.2
30..	5.2	2	T	5.9	1	T	7.2	8	.2
31..	5.0	2	T	5.6	1	T	--	--	
Total	218.7	--	5.3	264.8	--	33.2	134.5	--	12.8

	OCTOBER			NOVEMBER			DECEMBER		
1..	3.8	2	T	2.6	1	T	2.1	1	T
2..	3.2	1	T	2.7	1	T	2.0	1	T
3..	3.0	1	T	2.7	2	T	2.2	3	T
4..	3.2	1	T	3.0	4	T	2.2	2	T
5..	3.2	1	T	6.9	11	S .3	2.0	1	T
6..	3.6	1	T	2.8	2	T	2.0	1	T
7..	3.6	1	T	2.7	2	T	2.0	1	T
8..	19.7	16	K 2	2.6	2	T	3.2	2	T
9..	10.1	3	.1	2.4	2	T	3.3	5	T
10..	5.3	2	T	2.4	2	T	7.0	8	.2
11..	4.2	2	T	2.4	2	T	7.7	5	.1
12..	3.8	1	T	2.2	2	T	3.2	2	T
13..	7.5	6	.1	2.2	2	T	2.6	1	T
14..	5.0	1	T	2.2	2	T	2.2	1	T
15..	4.0	1	T	2.2	2	T	2.1	1	T
16..	4.0	1	T	2.2	2	T	7.2	4	.1
17..	3.8	1	T	2.2	2	T	33.7	11	1.0
18..	3.4	1	T	2.1	2	T	10.0	3	.1
19..	3.2	1	T	2.1	2	T	5.0	3	T
20..	3.2	1	T	2.1	2	T	3.8	3	T
21..	3.4	1	T	2.1	1	T	3.4	2	T
22..	3.0	1	T	2.1	1	T	3.2	1	T
23..	3.2	1	T	2.1	1	T	3.0	1	T
24..	3.2	1	T	2.0	1	T	2.8	1	T
25..	3.0	1	T	2.1	1	T	2.8	1	T
26..	2.8	1	T	2.1	1	T	3.8	2	T
27..	3.0	1	T	2.0	1	T	6.2	3	.1
28..	2.8	1	T	2.0	1	T	3.6	2	T
29..	2.7	1	T	2.2	2	T	3.0	1	T
30..	2.7	1	T	2.4	2	T	2.8	1	T
31..	2.7	1	T	--	--	--	3.0	1	T
Total	133.3	--	2.5	73.8	--	0.6	143.1	--	2.0

S Computed by subdividing day.
T Less than 0.05 ton.
K Computed from estimated-concentration graph and subdividing day.

40-8755. YONA-GAWA AT YONA, OKINAWA--Continued

Suspended sediment, fiscal year July 1964 to June 1965--Continued

Day	JANUARY Mean discharge (cfs)	Suspended sediment Mean concentration (ppm)	Suspended sediment Tons per day	FEBRUARY Mean discharge (cfs)	Suspended sediment Mean concentration (ppm)	Suspended sediment Tons per day	MARCH Mean discharge (cfs)	Suspended sediment Mean concentration (ppm)	Suspended sediment Tons per day
1..	2.7	1	T	2.7	1	T	3.2	2	T
2..	2.6	1	T	2.6	1	T	3.4	2	T
3..	28.0	16	K 4	2.4	1	T	3.2	2	T
4..	37.3	9	S 1.4	2.4	1	T	3.0	1	T
5..	8.8	3	.1	2.8	2	T	2.8	1	T
6..	7.2	2	T	4.0	4	T	3.4	3	T
7..	6.8	3	.1	2.7	1	T	8.1	8	.2
8..	6.5	2	T	2.4	1	T	4.7	2	T
9..	5.3	2	T	2.4	1	T	4.4	2	T
10..	4.7	1	T	2.8	2	T	3.8	2	T
11..	4.2	1	T	2.6	1	T	3.4	1	T
12..	4.0	1	T	2.4	1	T	3.2	1	T
13..	3.8	1	T	2.2	1	T	3.2	1	T
14..	3.6	1	T	2.2	1	T	3.0	1	T
15..	3.6	1	T	2.2	1	T	3.0	1	T
16..	3.4	1	T	2.1	1	T	3.6	3	T
17..	3.2	1	T	2.2	1	T	3.0	1	T
18..	3.2	1	T	2.2	1	T	2.8	1	T
19..	3.2	1	T	2.2	2	T	2.8	1	T
20..	3.0	1	T	71.3	40	S 14	2.8	2	T
21..	3.0	1	T	11.0	4	.1	2.7	2	T
22..	2.8	1	T	5.6	2	T	2.8	2	T
23..	2.8	1	T	5.0	4	.1	3.0	2	T
24..	2.7	1	T	4.4	2	T	3.5	3	T
25..	2.7	1	T	3.8	2	T	3.0	2	T
26..	2.7	1	T	3.4	2	T	3.0	2	T
27..	2.7	1	T	3.4	2	T	2.8	2	T
28..	2.7	1	T	3.4	2	T	2.7	2	T
29..	2.7	1	T	--	--	--	3.0	2	T
30..	2.8	1	T	--	--	--	6.2	7	.1
31..	2.6	1	T	--	--	--	3.4	2	T
Total	175.3	--	6.0	158.8	--	14.6	106.9	--	0.8

Day	APRIL Mean discharge (cfs)	Suspended sediment Mean concentration (ppm)	Suspended sediment Tons per day	MAY Mean discharge (cfs)	Suspended sediment Mean concentration (ppm)	Suspended sediment Tons per day	JUNE Mean discharge (cfs)	Suspended sediment Mean concentration (ppm)	Suspended sediment Tons per day
1..	3.0	2	T	4.0	2	T	10.0	3	0.1
2..	3.2	3	T	17.9	11	S 1.4	26.0	12	K 4
3..	7.6	5	.1	51.0	23	S 8.7	47.1	11	K 3
4..	12.6	8	.3	10.5	3	.1	18.9	4	.2
5..	6.5	2	T	8.3	3	.1	26.0	4	.3
6..	5.0	1	T	7.5	2	T	67.8	12	K 2
7..	4.2	1	T	7.5	2	T	32.0	3	.3
8..	4.0	1	T	7.2	3	.1	21.8	2	.1
9..	3.8	1	T	13.1	7	.2	17.5	2	.1
10..	8.3	7	.2	51.1	13	S 7.5	15.1	2	.1
11..	5.6	2	T	20.3	4	.2	12.6	2	.1
12..	4.2	2	T	13.2	2	.1	17.8	4	.2
13..	18.9	22	S 3.0	13.2	2	.1	13.8	2	.1
14..	8.3	3	.1	13.4	7	.3	11.5	2	.1
15..	6.2	2	T	24.4	8	.5	56.1	23	S 14
16..	5.3	2	T	34.7	11	S 1.8	21.0	5	.3
17..	5.0	2	T	18.9	4	.2	14.4	2	.1
18..	10.7	9	.3	15.1	5	.2	11.5	2	.1
19..	7.9	3	.1	15.7	5	.2	10.0	2	.1
20..	6.2	2	T	13.2	3	.1	12.6	5	.2
21..	5.3	2	T	61.8	17	K 6	176	105	S 290
22..	5.0	1	T	79.9	16	K 7	33.0	18	1.6
23..	4.7	1	T	58.3	13	K 3	166	215	S 535
24..	4.4	1	T	39.4	6	.6	55.2	12	1.8
25..	4.2	1	T	25.0	5	.3	30.0	7	.6
26..	4.0	1	T	20.3	3	.2	23.4	5	.3
27..	4.0	1	T	16.9	3	.1	20.3	3	.2
28..	3.8	1	T	13.8	3	.1	23.4	5	.3
29..	6.7	5	.1	12.0	2	.1	17.5	3	.1
30..	5.3	3	T	11.0	2	.1	15.1	3	.1
31..	--	--	--	9.5	2	.1	--	--	
Total	183.9	--	4.6	708.1	--	39.5	1023.4	--	855.5

Total discharge for year (cfs-days)..... 3,324.6
Total load for year (tons)..... 977.4

S Computed by subdividing day.
T Less than 0.05 ton.
K Computed from estimated-concentration graph and subdividing day.

40-8755. YONA-GAWA AT YONA, OKINAWA--Continued

Particle-size analyses of bed material, May 1964 to June 1965

(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water temperature (°F)	Sampling point	Discharge (cfs)	Sediment concentration (ppm)	Sediment discharge (tons per day)	Bed material											Method of analysis
							Percent finer than size indicated, in millimeters											
							0.062	0.125	0.250	0.500	1.000	2.000	4.000	8.000	16.000	32.000	64.000	
May 25, 1965.....	1400	69	6	25				1	2	6	15	37	48	65	80	95	100	S

40-8775. GENKA-KAWA NEAR GENKA, OKINAWA

LOCATION.--At gaging station 1.2 miles south of Genka, and 2.1 miles southeast of Nakaoshi.
DRAINAGE AREA.--3.9 square miles, approximately.
RECORDS AVAILABLE.--Water temperatures: May 1964 to June 1965.
Sediment records: May 1964 to June 1965.
EXTREMES, 1964-65.--Water temperatures: Maximum, 84°F Sept. 2, 9; minimum, 52°F Jan. 26, 27.
Sediment concentrations: Maximum daily, 3,180 ppm Feb. 20; minimum daily, 1 ppm on many days.
Sediment loads: Maximum daily, 11,000 tons May 22; minimum daily, less than 0.05 ton on many days.
EXTREMES, May 1964 to June 1965.--Water temperatures: Maximum, 84°F Sept. 2, 9, 1964; minimum, 52°F Jan. 26, 27, 1965.
Sediment concentrations: Maximum daily, 3,180 ppm Feb. 20, 1965; minimum daily, 1 ppm on many days.
Sediment loads: Maximum daily, 11,000 tons May 22, 1965; minimum daily, less than 0.05 ton on many days.

Temperature (°F) of water, May to June 1964

Month	Day																														Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
May.....	72	71	71	75	76	72	71	71	--	76	71	69	70	66	73	73	72	72	70	70	70	72	74	74	73	73	71	74	73	70	70	72
June.....	71	71	70	69	69	70	70	69	70	65	70	75	74	75	70	70	70	71	70	75	75	71	72	72	76	73	76	74	76	76	--	72

Temperature (°F) of water, fiscal year July 1964 to June 1965

Month	Day																														Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
July.....	--	--	--	75	75	75	76	76	75	75	76	75	75	75	76	75	75	75	76	75	76	75	76	75	--	--	75	75	76	75	77	75
August.....	78	79	76	78	78	78	78	79	78	80	80	80	80	78	79	78	77	79	80	79	76	77	77	78	76	79	75	74	74	75	75	78
September....	76	84	76	78	78	81	80	81	84	79	77	77	77	78	78	79	79	79	78	78	77	77	79	78	78	78	78	78	77	76	--	78
October.....	76	76	76	78	76	79	76	76	74	72	73	73	73	76	77	76	76	77	77	76	79	78	75	75	74	74	75	76	73	71	74	75
November.....	74	72	73	72	72	71	71	71	72	69	69	67	66	66	60	66	66	66	64	64	64	65	65	65	62	65	61	61	63	65	--	67
December.....	65	63	62	60	61	59	60	60	--	65	65	64	--	--	--	64	66	61	60	62	62	62	60	59	62	64	64	64	63	61	64	62
January.....	61	62	60	--	--	61	60	58	53	55	53	53	53	54	55	56	53	54	54	59	59	54	55	54	53	52	52	54	--	--	--	56
February.....	--	57	57	57	57	58	57	57	63	63	62	62	62	60	58	60	63	60	60	64	65	62	60	60	60	57	57	59	--	--	--	60
March.....	62	64	64	61	60	59	59	59	60	61	58	58	56	55	56	57	57	57	63	60	62	62	65	62	62	62	61	61	61	60	64	60
April.....	61	62	60	62	60	61	66	67	68	66	62	63	66	66	67	64	64	67	69	66	65	64	65	69	69	71	70	71	71	70	--	66
May.....	71	--	67	67	63	66	68	--	72	69	69	--	72	71	71	72	67	68	69	70	70	69	68	72	--	72	72	72	71	71	--	70
June.....	70	69	71	72	70	71	70	70	70	70	75	74	74	74	74	71	74	77	75	74	74	72	74	74	73	74	75	76	77	81	--	73

40-8775. GENKA-KAWA NEAR GENKA, OKINAWA--Continued

Suspended sediment, May to June 1964

Day	APRIL			MAY			JUNE		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1..				3.0	1	T	80.0	38	S 11
2..				2.8	1	T	164	132	B 90
3..				3.0	1	T	58.6	12	1.9
4..				2.8	1	T	33.8	9	.8
5..				3.2	4	T	34.7	12	1.1
6..				8.5	12	.3	28.2	9	.7
7..				10.0	14	.4	24.3	9	.6
8..				7.8	7	.1	60.7	52	S 16
9..				36.5	103	K 10	32.8	7	.6
10..				10.3	12	.3	25.1	3	.2
11..				24.6	90	K 10	24.3	3	.2
12..				14.9	8	.3	23.1	5	.3
13..				7.3	2	T	33.5	16	1.4
14..				5.3	2	T	29.0	5	.4
15..				4.8	2	T	221	144	S 156
16..				4.2	2	T	388	--	E 10000
17..				4.2	2	T	99.7	40	11
18..				4.2	2	T	100	80	22
19..				64.6	58	S 25	64.9	9	1.6
20..				21.2	4	.2	41.6	3	.3
21..				12.2	3	.1	33.8	3	.3
22..				8.5	3	.1	39.7	25	2.7
23..				8.1	3	.1	58.2	40	6.3
24..				6.6	2	T	37.6	2	.2
25..				6.6	2	T	30.0	1	.1
26..				5.9	2	T	25.9	1	.1
27..				5.6	2	T	22.8	1	.1
28..				5.6	2	T	19.8	1	.1
29..				5.3	2	T	18.5	1	T
30..				154	150	K 130	16.4	1	T
31..				98.1	60	K 30	--	--	
Total				559.7	--	207.3	1870.0	--	10326.1

Total discharge for period (cfs-days)..... 2,429.7
Total load for period (tons)..... 10,533.4

E Estimated.
S Computed by subdividing day.
T Less than 0.05 ton.
K Computed from estimated-concentration graph and subdividing day.

40-8775. GENKA-KAWA NEAR GENKA, OKINAWA--Continued

Suspended sediment, fiscal year July 1964 to June 1965

Day	JULY			AUGUST			SEPTEMBER		
	Mean discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Tons per day	Mean discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Tons per day	Mean discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Tons per day
1..	14.3	1	T	11.4	3	0.1	5.6	3	T
2..	13.4	1	T	11.0	3	.1	5.4	3	T
3..	12.9	1	T	11.4	3	.1	5.4	3	T
4..	12.9	1	T	10.5	3	.1	5.4	3	T
5..	12.4	1	T	9.3	3	.1	5.2	3	T
6..	11.9	1	T	9.0	3	.1	5.2	3	T
7..	11.4	2	.1	8.7	3	.1	5.2	2	T
8..	11.4	2	.1	9.3	3	.1	5.1	2	T
9..	11.0	2	.1	9.0	3	.1	5.1	2	T
10..	10.5	2	.1	8.0	3	.1	5.1	2	T
11..	10.0	2	.1	7.4	3	.1	4.9	2	T
12..	9.7	2	.1	7.0	3	.1	4.9	2	T
13..	9.3	1	T	7.4	3	.1	4.9	2	T
14..	9.0	1	T	6.4	3	.1	4.9	2	T
15..	9.0	1	T	6.4	3	.1	4.9	2	T
16..	9.0	1	T	7.0	3	.1	4.9	3	T
17..	11.2	4	.1	28.0	--	E 80	4.9	3	T
18..	8.7	2	T	11.0	2	.1	4.7	3	T
19..	8.0	2	T	8.4	2	T	4.7	3	T
20..	24.6	47	K 6	7.7	2	T	4.6	3	T
21..	9.3	2	.1	8.0	9	.2	4.9	3	T
22..	8.0	2	T	8.0	6	.1	4.6	3	T
23..	11.2	3	.1	7.0	2	T	4.6	3	T
24..	8.4	2	T	6.7	2	T	4.6	3	T
25..	8.7	2	T	6.2	1	T	4.4	3	T
26..	19.6	31	K 6	6.0	1	T	4.9	4	.1
27..	219	129	K 220	6.0	1	T	5.4	6	.1
28..	34.0	12	1.1	5.8	1	T	4.7	3	T
29..	19.1	5	.3	5.8	1	T	11.5	30	S 1.4
30..	14.8	3	.1	5.8	1	T	12.9	20	.7
31..	12.9	3	.1	5.6	1	T	--	--	
Total	595.6	--	235.0	265.2	--	82.3	163.5	--	3.3

Day	OCTOBER			NOVEMBER			DECEMBER		
1..	5.2	3	T	4.9	4	0.1	3.6	2	T
2..	4.4	2	T	5.8	5	.1	3.6	2	T
3..	4.2	1	T	4.7	2	T	3.9	2	T
4..	4.3	1	T	4.7	2	T	4.4	2	T
5..	4.2	1	T	21.5	51	S 8.8	3.5	2	T
6..	4.2	1	T	4.6	1	T	3.4	2	T
7..	4.3	1	T	4.2	1	T	3.4	2	T
8..	49.4	75	S 19	4.0	1	T	14.8	80	K 10
9..	21.9	12	.7	4.0	1	T	7.2	15	.3
10..	8.4	2	T	4.2	1	T	13.7	20	.7
11..	6.7	2	T	3.9	1	T	8.0	5	.1
12..	6.2	2	T	3.6	1	T	5.2	3	T
13..	10.4	19	S .8	3.5	1	T	4.4	2	T
14..	12.0	9	.3	3.4	1	T	4.7	2	T
15..	6.7	2	T	3.4	1	T	4.3	2	T
16..	6.0	2	T	3.4	1	T	26.7	90	K 40
17..	5.8	2	T	3.4	1	T	106	200	K 90
18..	5.4	2	T	3.4	1	T	30.3	10	.8
19..	5.2	2	T	3.4	1	T	12.9	4	.1
20..	5.2	2	T	3.4	1	T	9.0	3	.1
21..	5.2	2	T	3.4	1	T	8.0	2	T
22..	5.1	2	T	3.4	1	T	7.0	2	T
23..	5.1	2	T	3.4	1	T	7.4	3	.1
24..	5.2	2	T	3.4	1	T	6.7	1	T
25..	4.9	2	T	3.3	1	T	6.0	1	T
26..	4.7	1	T	3.3	1	T	6.2	1	T
27..	4.7	1	T	3.3	1	T	6.0	1	T
28..	4.7	1	T	3.3	1	T	5.8	1	T
29..	4.7	1	T	3.9	4	T	4.9	1	T
30..	4.7	1	T	4.4	4	T	4.9	1	T
31..	4.7	1	T	--	--	--	6.0	1	T
Total	233.8	--	21.4	132.5	--	9.4	341.9	--	142.7

E Estimated.
S Computed by sbudividing day.
T Less than 0.05 ton.
K Computed from estimated-concentration graph and subdividing day.

40-8775. GENKA-KAWA NEAR GENKA, OKINAWA--Continued

Suspended sediment, fiscal year July 1964 to June 1965--Continued

Day	JANUARY Mean discharge (cfs)	JANUARY Suspended sediment Mean concentration (ppm)	JANUARY Suspended sediment Tons per day	FEBRUARY Mean discharge (cfs)	FEBRUARY Suspended sediment Mean concentration (ppm)	FEBRUARY Suspended sediment Tons per day	MARCH Mean discharge (cfs)	MARCH Suspended sediment Mean concentration (ppm)	MARCH Suspended sediment Tons per day
1..	4.6	1	T	4.4	1	T	8.0	2	T
2..	4.4	1	T	4.3	1	T	8.0	2	T
3..	29.6	60	K 10	3.6	1	T	6.7	2	T
4..	55.8	80	K 30	3.6	1	T	6.7	2	T
5..	12.6	6	.2	4.3	2	T	6.4	2	T
6..	11.0	4	.1	5.6	4	.1	8.0	3	.1
7..	10.5	3	.1	3.9	2	T	12.9	5	.2
8..	10.0	2	.1	3.4	2	T	8.4	2	T
9..	8.0	2	T	3.4	2	T	8.0	2	T
10..	7.7	2	T	5.6	8	.1	5.2	1	T
11..	7.0	1	T	4.4	2	T	5.1	1	T
12..	6.7	1	T	3.9	1	T	4.9	1	T
13..	6.7	1	T	3.4	1	T	4.9	1	T
14..	6.2	1	T	3.2	1	T	4.3	1	T
15..	6.0	1	T	3.2	1	T	4.3	2	T
16..	6.2	1	T	3.4	1	T	10.8	5	.1
17..	6.0	1	T	3.9	1	T	4.3	2	T
18..	6.0	1	T	3.6	1	T	3.8	2	T
19..	6.0	1	T	3.6	1	T	3.8	2	T
20..	5.8	1	T	246	3180	S 9150	3.4	2	T
21..	4.9	1	T	43.2	7	.8	3.4	2	T
22..	4.9	1	T	19.8	4	.2	6.4	3	.1
23..	4.7	1	T	19.8	8	.4	6.4	3	.1
24..	4.7	1	T	14.8	4	.2	14.8	12	.5
25..	4.7	1	T	11.0	2	.1	8.0	5	.1
26..	4.6	1	T	8.7	2	T	6.4	5	.1
27..	4.6	1	T	8.4	2	T	4.9	4	.1
28..	4.4	1	T	8.4	2	T	3.8	4	T
29..	4.4	1	T	--	--	--	4.9	4	.1
30..	5.6	3	T	--	--	--	20.2	12	.7
31..	4.3	1	T	--	--	--	8.7	3	.1
Total	268.6	--	41.0	454.8	--	9152.3	215.8	--	2.8

Day	APRIL Mean discharge (cfs)	APRIL Suspended sediment Mean concentration (ppm)	APRIL Suspended sediment Tons per day	MAY Mean discharge (cfs)	MAY Suspended sediment Mean concentration (ppm)	MAY Suspended sediment Tons per day	JUNE Mean discharge (cfs)	JUNE Suspended sediment Mean concentration (ppm)	JUNE Suspended sediment Tons per day
1..	6.7	2	T	5.1	3	T	22.9	18	1.1
2..	6.7	2	T	9.4	12	.3	34.9	188	S 59
3..	12.9	4	.1	42.5	794	S 304	50.0	104	S 31
4..	14.8	4	.2	8.7	5	.1	31.1	50	4.2
5..	12.9	3	.1	6.7	3	.1	71.2	160	31
6..	8.7	3	.1	6.7	5	.1	92.0	385	S 128
7..	6.7	2	T	10.5	5	.1	49.8	11	1.5
8..	6.7	2	T	8.0	5	.1	40.0	8	.9
9..	6.4	2	T	40.6	745	S 272	32.0	4	.3
10..	15.2	17	S .9	32.5	247	S 47	28.3	3	.2
11..	11.0	4	.1	24.7	40	2.7	25.6	2	.1
12..	8.0	3	.1	12.9	6	.2	30.5	8	.7
13..	27.2	258	S 50	8.4	3	.1	33.0	8	.7
14..	12.9	7	.2	5.9	12	.2	26.5	3	.2
15..	8.4	4	.1	14.3	14	.5	155	997	S 1590
16..	7.7	4	.1	61.0	612	S 317	64.6	45	7.8
17..	7.4	3	.1	39.0	13	1.4	44.3	20	2.4
18..	21.7	46	S 4.5	33.0	7	.6	37.0	12	1.2
19..	14.3	8	.3	34.0	7	.6	32.0	8	.7
20..	9.7	4	.1	29.2	8	.6	72.0	546	S 294
21..	9.0	3	.1	106	714	S 608	302	1660	S 3820
22..	8.0	2	T	283	2770	S 11000	73.4	40	7.9
23..	6.7	2	T	164	667	S 803	62.2	54	S 12
24..	6.7	2	T	88.5	35	8.4	54.0	40	5.8
25..	6.0	2	T	53.2	17	2.4	44.3	8	1.0
26..	6.0	3	T	41.0	11	1.2	40.0	5	.5
27..	6.7	3	.1	33.0	7	.6	40.3	10	1.1
28..	5.1	2	T	27.4	5	.4	54.7	40	5.9
29..	8.2	10	.2	24.7	5	.3	37.0	6	.6
30..	8.0	4	.1	22.0	5	.3	32.0	4	.3
31..	--	--	--	20.6	4	.2	--	--	
Total	296.4	--	57.9	1296.5	--	13372.5	1712.6	--	6010.1

Total discharge for year (cfs-days)..... 5,977.2
Total load for year (tons)..... 29,130.7

S Computed by subdividing day.
T Less than 0.05 ton.
K Computed from estimated-concentration graph and subdividing day.

40-8775. GENKA-KAWA NEAR GENKA, OKINAWA--Continued

Particle-size analyses of suspended sediment, May 1964 to June 1965

(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water temperature (°F)	Sampling point	Discharge (cfs)	Sediment concentration (ppm)	Sediment discharge (tons per day)	Suspended sediment: Percent finer than size indicated, in millimeters											Method of analysis
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
May 22, 1965.....	1260	70		1260	3250		17	23	29	39	45	51	68	82	90	98	100	VPWC
May 22.....	1530	69		425	1050							56	65	77	92	96	100	V

Particle-size analyses of bed material, May 1964 to June 1965

(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water temperature (°F)	Sampling point	Discharge (cfs)	Sediment concentration (ppm)	Sediment discharge (tons per day)	Bed material: Percent finer than size indicated, in millimeters											Method of analysis
							0.062	0.125	0.250	0.500	1.000	2.000	4.000	8.000	16.000	32.000	64.000	
May 24, 1965.....	1430		6	85				1	2	4	9	17	29	50	73	94	100	S

40-8842. FUKUJI-GAWA AT FUKUJI, OKINAWA

LOCATION.--At gaging station at Fukuji, 0.9 mile north of Kawata, and 1.3 miles northeast of Taira.
DRAINAGE AREA.--12 square miles, approximately.
RECORDS AVAILABLE.--Water temperatures: May 1964 to June 1965.
Sediment records: May 1964 to June 1965.
EXTREMES, 1964-65.--Water temperatures: Maximum, 83°F July 13-16; minimum, 51°F Jan. 16.
Sediment concentrations: Maximum daily, 4,500 ppm June 23; minimum daily, 1 ppm on many days.
Sediment loads: Maximum daily, 23,000 tons June 21; minimum daily, less than 0.05 ton on many days.
EXTREMES, May 1964 to June 1965.--Water temperatures: Maximum, 83°F July 13-16, 1964; minimum, 51°F Jan. 16, 1965.
Sediment concentrations: Maximum daily, 4,500 ppm June 23, 1965; minimum daily, 1 ppm on many days.
Sediment loads: Maximum daily, 23,000 tons June 21, 1965; minimum daily, less than 0.05 ton on many days.

Temperature (°F) of water, May to June 1964

Month	Day																															Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
May.....	73	70	70	72	75	76	75	70	73	70	74	69	68	69	68	70	71	72	72	70	72	74	74	74	75	74	73	73	73	74	70	72
June.....	70	70	69	68	68	67	69	70	68	69	73	73	74	73	74	70	70	70	71	73	75	75	73	74	76	78	78	78	79	80	--	72

Temperature (°F) of water, fiscal year July 1964 to June 1965

Month	Day																															Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
July.....	80	80	80	80	80	81	81	81	80	80	81	81	83	83	83	83	82	82	82	82	76	80	81	81	81	81	68	68	79	80	80	80
August.....	80	79	80	76	78	80	80	81	82	80	81	82	82	80	79	80	80	77	78	79	79	77	76	76	76	76	76	76	75	75	76	78
September....	79	78	80	80	80	79	80	80	81	80	79	80	81	80	81	81	81	81	81	80	80	79	80	79	79	79	78	78	77	76	--	80
October.....	76	78	75	77	78	78	78	81	77	76	73	73	75	73	74	76	76	75	74	75	77	77	77	77	73	72	72	72	72	70	71	75
November.....	72	72	72	72	72	71	71	70	71	70	68	68	66	64	65	64	63	63	66	62	62	63	63	62	61	60	59	60	66	67	--	66
December.....	66	62	61	59	58	58	59	60	62	64	64	63	61	60	60	64	--	60	60	60	59	58	60	61	60	60	62	61	60	61	62	61
January.....	60	58	59	59	59	58	59	59	54	54	54	53	53	52	52	51	52	52	57	57	57	56	56	58	58	57	58	57	57	60	57	56
February.....	58	58	54	55	56	57	55	57	61	62	61	59	58	58	57	57	60	61	60	63	62	64	61	59	58	58	57	57	--	--	--	59
March.....	58	60	61	61	60	59	59	60	57	57	57	59	57	56	55	58	55	56	58	60	59	62	62	65	62	62	60	60	61	61	62	59
April.....	61	63	61	61	62	62	60	64	65	66	63	63	66	62	63	63	65	68	65	68	67	65	68	70	71	71	72	68	75	68	--	66
May.....	65	68	67	65	65	68	68	68	68	71	68	67	70	70	71	69	69	65	67	68	70	68	68	68	68	70	70	68	69	68	68	68
June.....	68	70	70	72	71	69	70	70	70	70	72	75	71	72	73	71	72	75	76	77	76	73	73	73	73	75	75	75	74	75	--	73

40-8842. FUKUJI-GAWA AT FUKUJI, OKINAWA--Continued

Suspended sediment, May to June 1964

Day	APRIL			MAY			JUNE		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1..				7.7	2	T	256	20	14
2..				7.0	2	T	509	230	K 780
3..				7.4	3	.1	153	5	2.1
4..				7.4	3	.1	88.1	3	.7
5..				7.7	3	.1	79.4	5	1.1
6..				16.9	23	1.0	75.4	3	.6
7..				364	185	S 603	56.3	3	.5
8..				72.8	40	S 8	283	100	K 190
9..				456	181	S 707	95.4	5	1.3
10..				64.8	6	1.0	65.9	3	.5
11..				40.2	4	.4	61.1	3	.5
12..				41.2	4	.4	61.1	3	.5
13..				27.5	2	.1	80.9	8	1.7
14..				21.5	2	.1	85.2	6	1.4
15..				18.1	2	.1	940	1400	K 10000
16..				16.0	1	T	1650	715	S 9810
17..				15.3	1	T	356	40	S 40
18..				14.6	1	T	407	99	S 183
19..				95.1	54	S 19	264	20	14
20..				65.9	3	.5	155	10	4.2
21..				37.3	3	.3	120	10	3.2
22..				27.5	3	.2	144	30	K 20
23..				23.4	2	.1	192	33	S 24
24..				21.5	2	.1	104	6	1.7
25..				28.4	2	.2	86.5	3	.7
26..				22.4	2	.1	73.2	3	.6
27..				18.9	2	.1	67.5	2	.4
28..				19.7	2	.1	62.7	2	.3
29..				19.7	2	.1	56.3	2	.3
30..				885	210	K 1200	53.1	2	.3
31..				414	130	K 310	--	--	
Total				2884.9	--	2852.4	6681.1	--	21097.6

Total discharge for period (cfs-days)..... 9,566.0
Total load for period (tons)..... 23,950.0

S Computed by subdividing day.
T Less than 0.05 ton.
K Computed from estimated-concentration graph and subdividing day.

40-8842. FUKUJI-GAWA AT FUKUJI, OKINAWA--Continued

Suspended sediment, fiscal year July 1964 to June 1965

Day	JULY Mean discharge (cfs)	JULY Suspended sediment Mean concentration (ppm)	JULY Suspended sediment Tons per day	AUGUST Mean discharge (cfs)	AUGUST Suspended sediment Mean concentration (ppm)	AUGUST Suspended sediment Tons per day	SEPTEMBER Mean discharge (cfs)	SEPTEMBER Suspended sediment Mean concentration (ppm)	SEPTEMBER Suspended sediment Tons per day
1..	42.1	2	0.2	20.0	2	0.1	25.0	1	0.1
2..	40.3	2	.2	20.0	2	.1	22.5	1	.1
3..	39.5	2	.2	221	750	K 2700	21.6	1	.1
4..	35.8	2	.2	110	110	S 53	20.8	1	.1
5..	34.6	1	.1	37.0	6	.6	20.0	1	.1
6..	33.5	1	.1	30.0	3	.2	18.5	1	T
7..	31.2	1	.1	27.4	2	.1	18.5	1	T
8..	31.2	1	.1	25.0	2	.1	17.8	1	T
9..	30.0	1	.1	23.3	2	.1	17.1	1	T
10..	29.0	1	.1	22.5	1	.1	33.3	5	S .8
11..	29.0	1	.1	21.6	1	.1	24.3	5	.3
12..	27.0	1	.1	22.5	1	.1	17.8	2	.1
13..	26.0	1	.1	25.0	1	.1	17.1	2	.1
14..	25.0	1	.1	21.6	1	.1	15.8	2	.1
15..	24.1	1	.1	20.8	1	.1	15.8	2	.1
16..	24.1	1	.1	21.0	3	.2	15.2	2	.1
17..	24.1	1	.1	371	891	S 2380	15.2	2	.1
18..	23.3	1	.1	73.8	11	S 2.2	14.5	2	.1
19..	21.6	1	.1	34.6	3	.3	14.5	1	T
20..	44.0	9	S 1.6	29.0	3	.2	13.4	1	T
21..	25.0	2	.1	187	51	S 68	13.4	1	T
22..	21.6	1	.1	97.8	36	S 27	12.8	1	T
23..	26.5	1	.1	208	42	K 47	12.8	1	T
24..	22.5	1	.1	61.2	4	.7	12.8	1	T
25..	24.1	1	.1	45.0	2	.2	12.2	1	T
26..	23.7	1	.1	37.0	2	.2	15.8	3	.1
27..	337	130	S 214	32.2	2	.2	24.7	6	.4
28..	42.1	5	.6	30.0	2	.2	16.4	4	.2
29..	26.0	2	.1	27.0	2	.1	117	133	S 56
30..	22.5	2	.1	26.0	2	.1	42.6	60	6.9
31..	21.6	2	.1	24.1	1	.1	--	--	
Total	1208.0	--	219.4	1952.4	--	5281.6	659.2	--	66.3
	OCTOBER			NOVEMBER			DECEMBER		
1..	18.1	15	0.7	12.2	1	T	9.7	1	T
2..	15.2	3	.1	11.7	1	T	9.2	1	T
3..	13.4	3	.1	11.2	1	T	9.7	1	T
4..	14.5	3	.1	11.7	1	T	12.2	2	.1
5..	13.4	3	.1	51.5	60	S 9.2	9.2	1	T
6..	13.9	5	.2	13.9	4	.2	8.8	1	T
7..	19.3	9	.5	11.7	2	.1	8.8	1	T
8..	74.3	65	S 19	11.2	2	.1	13.4	10	.4
9..	46.0	20	2.5	11.2	2	.1	16.1	4	.2
10..	19.3	7	.4	10.6	2	.1	26.8	12	.9
11..	15.8	2	.1	10.2	2	.1	52.1	35	4.9
12..	15.2	2	.1	9.7	2	.1	16.4	3	.1
13..	102	86	S 74	9.2	2	T	11.2	2	.1
14..	64.8	50	8.7	9.2	1	T	10.2	1	T
15..	23.3	6	.4	9.2	1	T	9.2	1	T
16..	25.0	6	.4	9.2	1	T	101	270	K 780
17..	18.5	3	.1	9.2	1	T	326	720	K 780
18..	17.1	3	.1	9.2	1	T	60.6	10	1.6
19..	15.8	3	.1	9.7	1	T	23.3	2	.1
20..	15.2	3	.1	9.2	1	T	17.8	1	T
21..	14.5	3	.1	9.2	1	T	15.2	1	T
22..	14.5	3	.1	9.2	1	T	13.9	1	T
23..	14.5	3	.1	9.2	1	T	13.9	1	T
24..	14.5	2	.1	9.2	1	T	12.2	1	T
25..	13.9	2	.1	8.8	1	T	11.7	1	T
26..	12.8	2	.1	8.8	1	T	13.9	1	T
27..	12.8	2	.1	8.3	1	T	22.5	2	.1
28..	12.8	2	.1	8.3	1	T	14.5	1	T
29..	12.2	2	.1	9.7	3	.1	12.2	1	T
30..	12.2	2	.1	15.2	8	.3	11.7	1	T
31..	12.2	2	.1	--	--	--	13.9	1	T
Total	707.0	--	108.9	346.8	--	10.9	907.3	--	1569.1

S Computed by subdividing day.
T Less than 0.05 ton.
K Computed from estimated-concentration graph and subdividing day.

40-8842. FUKUJI-GAWA AT FUKUJI, OKINAWA--Continued

Suspended sediment, fiscal year July 1964 to June 1965--Continued

Day	JANUARY Mean discharge (cfs)	JANUARY Suspended sediment Mean concentration (ppm)	JANUARY Suspended sediment Tons per day	FEBRUARY Mean discharge (cfs)	FEBRUARY Suspended sediment Mean concentration (ppm)	FEBRUARY Suspended sediment Tons per day	MARCH Mean discharge (cfs)	MARCH Suspended sediment Mean concentration (ppm)	MARCH Suspended sediment Tons per day
1..	11.7	1	T	10.6	1	T	14.0	1	T
2..	10.6	1	T	10.6	1	T	15.5	1	T
3..	93.7	30	S 17	10.2	1	T	14.0	1	T
4..	212	40	S 47	10.2	1	T	13.3	1	T
5..	30.3	3	.2	10.6	1	T	12.1	1	T
6..	23.3	2	.1	11.7	1	T	15.0	2	.1
7..	22.5	2	.1	10.6	1	T	33.1	5	.4
8..	23.3	2	.1	9.7	1	T	18.8	2	.1
9..	18.5	2	.1	9.7	1	T	16.3	1	T
10..	17.1	2	.1	12.2	1	T	14.0	1	T
11..	15.8	2	.1	12.2	1	T	12.7	1	T
12..	15.2	2	.1	9.7	1	T	12.7	1	T
13..	14.5	2	.1	9.2	1	T	12.7	1	T
14..	13.9	2	.1	9.2	1	T	12.1	1	T
15..	12.8	1	T	9.2	1	T	11.5	1	T
16..	12.8	1	T	9.2	1	T	14.0	1	T
17..	12.8	1	T	10.5	1	T	11.5	1	T
18..	12.2	1	T	10.2	1	T	10.9	1	T
19..	12.2	1	T	9.7	1	T	10.9	1	T
20..	12.2	1	T	471	1200	K 6100	10.4	1	T
21..	11.7	1	T	73.5	22	S 5.4	10.4	1	T
22..	11.2	1	T	26.8	2	.1	14.7	2	.1
23..	11.2	1	T	21.6	1	.1	18.8	2	.1
24..	11.2	1	T	19.8	1	.1	15.5	2	.1
25..	11.2	1	T	16.3	1	T	15.5	2	.1
26..	11.2	1	T	14.8	1	T	13.3	1	T
27..	10.6	1	T	15.5	1	T	12.1	1	T
28..	10.6	1	T	16.3	1	T	10.9	1	T
29..	11.2	1	T	--	--	--	10.9	1	T
30..	11.7	1	T	--	--	--	32.6	10	.9
31..	10.6	1	T	--	--	--	17.9	2	.1
Total	719.8	--	65.7	870.8	--	6106.4	458.1	--	2.7

Day	APRIL Mean discharge (cfs)	APRIL Suspended sediment Mean concentration (ppm)	APRIL Suspended sediment Tons per day	MAY Mean discharge (cfs)	MAY Suspended sediment Mean concentration (ppm)	MAY Suspended sediment Tons per day	JUNE Mean discharge (cfs)	JUNE Suspended sediment Mean concentration (ppm)	JUNE Suspended sediment Tons per day
1..	15.5	2	0.1	22.5	2	0.1	67.2	1	0.2
2..	14.8	2	.1	32.2	5	.4	134	38	S 43
3..	42.0	5	.6	184	146	S 210	279	61	S 88
4..	74.3	12	2.4	36.5	3	.3	93.0	6	1.5
5..	37.3	2	.2	28.0	2	.2	210	33	S 17
6..	22.5	1	.1	27.8	2	.2	298	45	S 39
7..	17.9	1	T	43.9	15	1.8	138	6	2.2
8..	17.2	1	T	32.5	10	.9	99.6	2	.5
9..	16.3	1	T	92.9	20	5.0	82.0	2	.4
10..	26.9	5	.4	215	92	S 140	72.4	2	.4
11..	22.5	3	.2	132	11	3.9	68.6	2	.4
12..	17.2	2	.1	67.2	4	.7	90.6	7	1.7
13..	79.7	62	S 25	53.8	4	.6	94.4	6	1.5
14..	38.6	20	2.1	48.5	4	.5	64.7	2	.3
15..	22.5	2	.1	85.3	6	1.4	363	1220	S 3420
16..	19.8	2	.1	345	924	S 1740	237	20	13
17..	17.9	1	T	102	8	2.2	93.0	8	2.0
18..	72.5	50	S 15	77.2	2	.4	76.2	5	1.0
19..	52.1	8	1.1	94.8	4	1.0	68.6	2	.4
20..	28.0	2	.2	75.9	2	.4	88.3	15	3.6
21..	24.5	2	.1	583	443	S 2010	1290	3700	K 23000
22..	21.6	1	.1	911	1500	S 5580	176	20	9.5
23..	21.6	1	.1	566	174	S 837	718	4500	K 17000
24..	20.7	1	.1	272	20	15	198	40	21
25..	19.8	1	.1	133	3	1.1	127	15	5.1
26..	20.7	2	.1	132	15	5.3	109	12	3.5
27..	22.5	2	.1	102	8	2.2	108	15	4.4
28..	17.9	1	T	77.2	2	.4	298	790	S 1880
29..	32.3	10	.9	69.2	2	.4	103	7	1.9
30..	37.8	5	.5	59.4	1	.2	84.2	3	.7
31..	--	--	--	53.8	1	.1	--	--	
Total	894.9	--	50.1	4755.6	--	10561.7	5928.8	--	45562.2

Total discharge for year (cfs-days)..... 19,408.7
Total load for year (tons)..... 69,605.0

S Computed by subdividing day.
T Less than 0.05 ton.
K Computed from estimated-concentration graph and subdividing day.

40-8842. FUKUJI-GAWA AT FUKUJI, OKINAWA--Continued

Particle-size analyses of bed material, May 1964 to June 1965

(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water temperature (°F)	Sampling point	Discharge (cfs)	Sediment concentration (ppm)	Sediment discharge (tons per day)	Bed material											Method of analysis
							Percent finer than size indicated, in millimeters											
							0.062	0.125	0.250	0.500	1.000	2.000	4.000	8.000	16.000	32.000	64.000	
May 26, 1965.....	1100	70	6	100					2	6	11	21	45	58	78	96	100	S

MISCELLANEOUS ANALYSES OF STREAMS IN OKINAWA

Periodic determinations of suspended-sediment discharge and particle-size analyses, May 1964 to June 1965

(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water temperature (°F)	Sampling point	Discharge (cfs)	Sediment concentration (ppm)	Sediment discharge (tons per day)	Suspended sediment: Percent finer than size indicated, in millimeters											Method of analysis
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
40-8752. BENOKI-GAWA AT BENOKI																		
June 17, 1964.....	1700	69		90.0	10	2.4												
July 28.....	1405	77		11.9	4	.1												
Aug. 26.....	1310	77		15.2	4	.1												
40-8762. TAKAZATO-GAWA NEAR HAMA																		
May 13, 1964.....	1105	66		4.8	1	T												
July 2.....	1415	79		4.3	1	T												
Aug. 4.....	1200	76		4.3	7	.1												
Aug. 28.....	1000	72		4.3	2	T												
40-8770. RIGHT BRANCH OF SOUTH FORK HENAN-GAWA NEAR TSUHA																		
June 29, 1964.....	1130	76		3.4	1	T												
July 14.....	1140	79		1.4	1	T												
July 27.....	1200	79		25	119	8.0												
Aug. 20.....	1140	79		1.1	1	T												
Sept. 30.....	1150	76		28	222	17												
Sept. 30.....	1200	76		31	179	15												
Dec. 17.....	1120	66		15	28	1.1												
Dec. 17.....	1515	66		24	49	3.2												
40-8780. MAKIYA-OKAWA AT MAKIYA																		
May 11, 1964.....	1700	68		30	1100	89												
40-8782. HANECHI-OKAWA AT KAWAKAMI																		
June 29, 1964.....	1330	84		18.0	4	0.2						--	--	--	--	--		
July 13.....	1235	85		6.1	3	T						--	--	--	--	--		
July 27.....	1445	79		190	252	130						--	--	--	--	--		
Aug. 10.....	1313	85		10.5	3	.1						--	--	--	--	--		
Aug. 18.....	1425	85		12.6	5	.2						--	--	--	--	--		
Sept. 2.....	1410	87		4.8	3	T						--	--	--	--	--		
Sept. 29.....	1430	79		5.2	7	.1						--	--	--	--	--		
May 18, 1965.....	1440	68		35	32	3.0						--	--	--	--	--		
May 22.....	1150	64		950	6150	15800						--	--	--	--	--		
May 22.....	1210	64		800	6800	14700						82	87	92	95	98	100	S
May 22.....	1330	65		800	2800	6000						--	--	--	--	--		
May 22.....	1400	65		700	2420	4600	28	42	53	70	79	84	92	96	98	100		VPWC
May 22.....	1445	65		500	1420	1900						--	--	--	--	--		
May 22.....	1540	65		390	1000	1100						--	--	--	--	--		
May 22.....	1725	64		270	580	420						92	97	100	--	--		V
May 24.....	1620	73		90	85	21						--	--	--	--	--		
June 6.....	1430	72		90	146	35						--	--	--	--	--		
June 6.....	1540	72		85	164	38						--	--	--	--	--		
June 6.....	1600	72		90	172	42						--	--	--	--	--		
June 17.....	1100	76		42	29	3.3						--	--	--	--	--		

T Less than 0.05 ton.

MISCELLANEOUS ANALYSES OF STREAMS IN OKINAWA--Continued

Periodic determinations of suspended-sediment discharge and particle-size analyses, May 1964 to June 1965--Continued
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water temperature (°F)	Sampling point	Discharge (cfs)	Sediment concentration (ppm)	Sediment discharge (tons per day)	Suspended sediment: Percent finer than size indicated, in millimeters											Method of analysis
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
40-8785. OI-KAWA AT JINGUSUKU																		
June 8, 1964.....	1540	68		20	146	11												
June 24.....	1300	75		9.1	11	.3												
June 25.....	1400	76		7.4	10	.2												
July 13.....	1110	77		1.8	3	T												
Aug. 10.....	1040	77		1.9	74	.4												
Sept. 2.....	1200	82		.6	45	.1												
Sept. 29.....	1040	74		.3	68	.1												
June 21, 1965.....	1200	74		150	685	280												
June 21.....	1300	74		140	420	160												
June 21.....	1330	74		130	380	130												
June 21.....	1430	74		150	1700	690												
40-8809. MACHINATO-GAWA NEAR OJANA																		
June 6, 1965.....	1340	70		1050	780	2200												
June 6.....	1425	70		930	650	1600												
June 6.....	1550	70		310	340	280												
40-8820. TENGAN-GAWA AT YAMASHIRO																		
June 5, 1964.....	1055	67		4.2	10	0.1												
June 12.....	1530	76		3.3	12	.1												
June 19.....	1235	76		12.4	19	.6												
July 3.....	1520	76		2.0	8	T												
July 10.....	1050	84		1.5	4	T												
July 17.....	1535	85		1.8	27	.1												
July 24.....	1425	86		1.4	48	.2												
July 31.....	1510	81		2.1	17	.1												
Aug. 7.....	1400	84		1.5	10	T												
Aug. 14.....	1555	85		1.3	31	.1												
Aug. 25.....	1500	87		1.1	6	T												
Sept. 1.....	1520	84		1.0	4	T												
Sept. 7.....	1345	87		.8	6	T												

T Less than 0.05 ton.

MISCELLANEOUS ANALYSES OF STREAMS IN OKINAWA--Continued

Periodic determinations of suspended-sediment discharge and particle-size analyses, May 1964 to June 1965--Continued
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water temperature (°F)	Sampling point	Discharge (cfs)	Sediment concentration (ppm)	Sediment discharge (tons per day)	Suspended sediment: Percent finer than size indicated, in millimeters											Method of analysis
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
40-8828. KANNA-GAWA NEAR KANNA																		
June 5, 1964.....	1350	67		5.4	5	0.1												
June 12.....	1400	76		2.8	52	.4												
June 19.....	1435	77		9.5	4	.1												
June 26.....	1435	78		4.5	4	T												
July 3.....	1320	78		2.9	2	T												
July 10.....	1340	83		2.2	1	T												
July 17.....	1315	81		3.9	17	.2												
July 24.....	1340	84		2.0	8	T												
July 31.....	1330	82		3.2	8	.1												
Aug. 7.....	1330	82		2.3	5	T												
Aug. 14.....	1355	85		2.0	5	T												
Aug. 25.....	1330	81		1.7	5	T												
Sept. 1.....	1330	80		1.4	5	T												
Sept. 7.....	1410	82		1.3	4	T												
Sept. 26.....	1300	83		1.4	13	T												
40-8833. LEFT FORK O-KAWA NEAR KUSHI																		
June 5, 1964.....	1020	65		.8	2	T												
June 12.....	1030	75		.7	2	T												
June 19.....	1250	74		4.0	3	T												
June 26.....	1025	75		1.4	2	T												
July 3.....	1025	74		.8	2	T												
July 10.....	1030	77		.6	2	T												
July 17.....	1045	77		.6	2	T												
July 24.....	1005	77		.4	2	T												
July 31.....	1000	76		.8	2	T												
Aug. 7.....	1005	79		.6	2	T												
Aug. 14.....	1000	77		.5	4	T												
Aug. 25.....	0955	70		.4	2	T												
Sept. 1.....	1015	71		.4	2	T												
Sept. 7.....	0940	77		.3	2	T												
Sept. 26.....	1020	77		.3	4	T												
40-8841. FUKUJI-GAWA NEAR YUBARU																		
June 4, 1964.....	1100	68		29.0	4	0.3												
June 11.....	1255	75		21.0	4	.2												
July 8.....	1305	84		12.5	3	.1												
July 15.....	1225	84		10.5	1	T												
Aug. 12.....	1055	82		9.2	1	T												
Aug. 18.....	1125	79		26.8	4	.3												
Sept. 11.....	1120	79		10.6	4	.1												

T Less than 0.05 ton.

MISCELLANEOUS ANALYSES OF STREAMS IN OKINAWA--Continued

Periodic determinations of suspended-sediment discharge and particle-size analyses, May 1964 to June 1965--Continued
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water temperature (°F)	Sampling point	Discharge (cfs)	Sediment concentration (ppm)	Sediment discharge (tons per day)	Suspended sediment: Percent finer than size indicated, in millimeters											Method of analysis
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
40-8846. AHA-GAWA AT AHA																		
May 12, 1964.....	1405	67		45.0	2	0.2												
June 3.....	1600	69		140	3	1.1												
June 16.....	1335	69		190	31	16												
June 17.....	1330	71		230	10	6.2												
July 1.....	1115	78		38.8	2	.2												
July 29.....	1235	87		26.4	2	.1												
Aug. 27.....	1055	76		34.1	3	.3												
Feb. 24, 1965.....	1420	58		17	4	.2												
May 3.....	0200	--		500	A 630	850												
May 3.....	0210	--		1440	A 560	2180												
May 22.....	--	--		2860	A 370	2750												
May 25.....	1050	69		123	A 3	1.0												
June 2.....	2320	--		500	A 440	590												
June 15.....	1650	--		1440	A 430	1670												
June 15.....	1700	--		2860	A 730	5640												
June 21.....	0830	--		500	A 960	1300												
June 21.....	0945	--		1440	A 920	3570												
June 21.....	1000	--		2860	A 2200	17000												
June 21.....	1010	--		4700	A 2500	33800												
40-8848. FUN-GAWA NEAR AHA																		
May 12, 1964.....	1540	--		13.6	3	0.1												
May 25.....	1605	--		10.1	3	.1												
June 3.....	1310	--		44.9	7	.9												
July 2.....	1120	--		14.7	3	.1												
July 29.....	1015	--		8.1	3	.1												
Aug. 27.....	1410	--		9.7	4	.1												
Jan. 7, 1965.....	1330	--		14.8	16	.6												

T Less than 0.05 ton.
A Sample collected with single-stage sampler.

MISCELLANEOUS ANALYSES OF STREAMS IN OKINAWA--Continued

Particle-size analyses of bed material, May 1964 to June 1965

(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water temperature (°F)	Sampling point	Discharge (cfs)	Sediment concentration (ppm)	Sediment discharge (tons per day)	Bed material: Percent finer than size indicated, in millimeters											Method of analysis
							0.062	0.125	0.250	0.500	1.000	2.000	4.000	8.000	16.000	32.000	64.000	
40-8782. HANECHI-OKAWA AT KAWAKAMI																		
May 24, 1965.....	1600	72	6	90				1	2	7	18	35	59	70	96	100		S

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